USDA United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Clinton County, Illinois

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

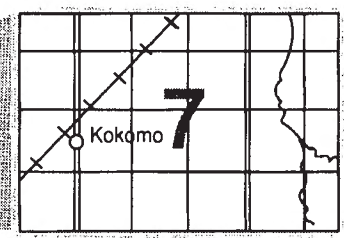
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



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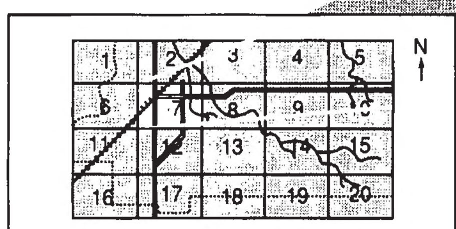
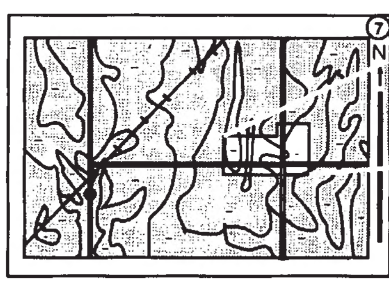


INDEX TO MAP SHEETS



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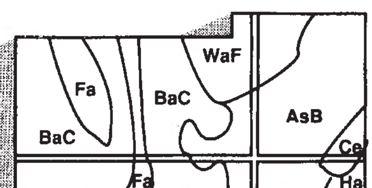

AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1989. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1989. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Clinton County Soil and Water Conservation District. Additional funding was provided by the Clinton County Board and the Illinois Department of Agriculture.

This soil survey is Illinois Agricultural Experiment Station Soil Report 157.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: In Clinton County, nearly level uplands, such as the area in the foreground, are used mainly as cropland. Trees are commonly in the more sloping areas.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Issued 2002

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

William J. Gradle
State Conservationist
Natural Resources Conservation Service

Soil Survey of
Clinton County, Illinois

By Gary Hamilton, Soil Scientist, United States Department of Agriculture, Natural Resources Conservation Service

Fieldwork by Gary Hamilton and G. Ward Lenz, Soil Scientists, Natural Resources Conservation Service, and Douglas B. Gaines and Neal Spangler, Soil Scientists, Clinton County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Illinois Agricultural Experiment Station

CLINTON COUNTY is in the southwestern part of Illinois (fig. 1). It is about 30 miles east of the metropolitan area of St. Louis. It has an area of 322,110 acres, or about 500 square miles. It is bordered on the north by Madison, Bond, and Fayette Counties; on the west by Madison and St. Clair Counties; on the east by Marion County; and on the south mainly by the Kaskaskia River and Crooked Creek, which separate Clinton County from Washington County.

Elevations range from 385 feet above sea level in the extreme southwest part of the county, along the Kaskaskia River, to 588 feet above sea level in the "Pelican Pouch," which is in an area southwest of Carlyle close to the river.

This soil survey updates the survey of Clinton County published in 1936 (Norton and others, 1936). It gives more recent soil interpretative information and has larger maps, which show soils in greater detail.

General Nature of the County

This section gives general information about the county. It describes history and development, natural resources, and climate

History and Development

In 1808, a wagon road was laid out through what is now Clinton County. It crossed the Kaskaskia River at the site of the present city of Carlyle (Brink, 1881). The survey of that road marked the time when settlers first set foot in the present limits of Clinton County. In 1811, a block house, or fort, was built at the present site of Carlyle to ward off Indian attacks. This house was the first building in what was to be Clinton County. In 1824, Clinton County, which was named in honor of the statesman DeWitte Clinton of New York, was officially formed from Washington, Bond, and Fayette Counties. At that time, 33,000 acres had been settled or purchased by speculators. All land entered at that early date was woodland. Grassland was appreciated, but wood was extremely useful to have at hand.

The population of the county grew from 5,139 in 1850 to 18,718 in 1880 because of the introduction of a railroad and the cheap price of government land (Brink, 1881). In 1980, the county had a population of 33,383 and had 15 incorporated communities. The two largest towns are Breese, which has a population of 3,516, and Carlyle, the county seat, which has a population of 3,388.

The transportation facilities in the county include five State highways and one interstate highway, which transects the southwestern part of the county. Four railroad lines serve parts of the county.

Natural Resources

Soil is the major natural resource in Clinton County. Most of the soils are nearly level. On about 72 percent of the acreage in the county, the soils have slopes of less than 2 percent; on 18 percent, they are gently sloping and have slopes of 2 to 5 percent; and on 10 percent, they are moderately sloping to steep and have slopes of more than 5 percent. Sodium in the soil

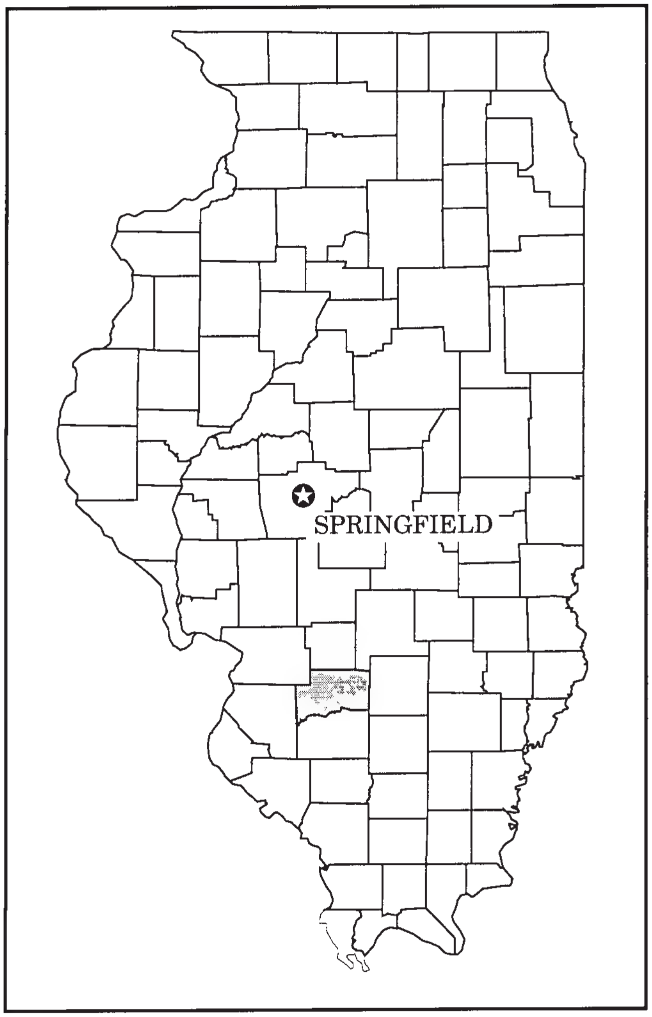

Figure 1.—Location of Clinton County in Illinois.

affects 112,477 acres in the county. On 76 percent of the acreage, the soils formed in loess, or windblown silty material, under timber and/or grass vegetation. On 24 percent of the acreage, the soils formed in alluvial material around streams and rivers. Watercourses, spread out like fingers, extend to nearly every part of the county. They flow mainly in a southwest direction, following the general course of the Kaskaskia River, into which they finally empty.

According to the 1987 Census of Agriculture, the county has 1,115 farms totaling 241,466 acres. The major crops and their acreages in the county are soybeans, 79,005 acres; corn, 66,635 acres; wheat, 26,543 acres; and hay, 23,556 acres. The county has 243 dairy farms. It ranks third in the State in the value of dairy products sold. Secondary farm products include swine, beef, poultry, grain sorghum, and timber. The sale of livestock and livestock products accounts for 69 percent of the total agricultural sales in the county, and the sale of crops accounts for 31 percent. The statewide averages for agricultural sales are 35 percent from the sale of livestock and 65 percent from the sale of crops (USDC, 1989).

The county has approximately 43,200 acres of woodland, most of which is on the flood plains along creeks and rivers and on the adjacent bluffs. Most of the wooded acreage is unimproved and privately owned and is used for hunting, camping, and fishing.

Carlyle Lake is the largest manmade lake in Illinois. At Carlyle, a 6,570-foot dam of the Kaskaskia River forms a 26,000-acre lake. About 20,000 acres of this lake is in Clinton County (U.S. Army Corps of Engineers). The Corps of Engineers owns 8,249 acres of land around that part of the lake. This land is operated by the Corps of Engineers and the Illinois Department of Conservation and is available for public use. Every year, 3.5 to 4 million people enjoy the recreational opportunities provided by Carlyle Lake. The influx of tourists traveling to the lake adds considerably to the economy of Clinton County.

The subsurface mineral resources in the county include coal, oil, sand, gravel, and limestone. Coal underlines the entire county. In the early 1900's, the county had as many as five shipping mines in operation. In 1977, a coal company opened a mine near Albers. Figures for I989 indicate the production of 2.8 million tons of coal and employment of 653 people. At the present time, the coal company is the largest noninstitutional employer in the county.

The first oil well was drilled in the county in 1911. The peak year for oil production was 1940, when the county produced 10,163,000 barrels. By 1979, production had decreased to 353,268 barrels, but every year new wells are completed. There are oil wells and some gas wells on both sides of Beaver Creek, which runs southwest through the center of the county. Many oil wells are in the southeastern part of the county, near Lost Creek and Crooked Creek. Some are west of Sugar Creek, in the southwestern part of the county.

The county currently has two sources of sand. One of these is a deposit of eolian sand southeast of Carlyle, close to the river. The county has no sources of gravel. Two areas of Hagerstown Drift west of the lake and directly across the county line in Bond County, however, are being mined for both gravel and sand. There are two inactive limestone quarries in Clinton County.

Climate

Wayne Wendland, Illinois State Water Survey, helped prepare this section.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Carlyle in the period 1962 to 1989. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 30.3 degrees F and the average daily minimum temperature is 20.6 degrees. The lowest temperature on record, which occurred on December 8, 1989, is -20 degrees. In summer, the average temperature is 75.6 degrees and the average daily maximum temperature is 86.0 degrees. The highest recorded temperature, which occurred on July 13, 1966, is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 38.12 inches. Of this, 20.63 inches, or about 54 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 10.35 inches. The heaviest 1-day rainfall during the period of record was 5.55 inches.

The average seasonal snowfall is about 13.3 inches. The greatest snow depth at any one time during the period of record was 23 inches. On the average, 18 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 65 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 48 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 12 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the

same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

General Soil Map Units

The general soil map in this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map of Clinton County joins with the maps in the soil surveys of Madison, Bond, Fayette, Marion, and Washington Counties. In places the names of soil associations do not exactly agree across county lines because of differences in the extent of the major soils in the associations or because some soils were not extensive enough to be included on the legend. The soils and parent material in these areas are similar, and the soils have similar potentials for use and similar management requirements.

Soil Descriptions

1. Hoyleton-Darmstadt-Cisne Association

Nearly level and gently sloping, somewhat poorly drained and poorly drained, slowly permeable and very slowly permeable, silty soils formed in loess and silty or loamy sediments over glacial till; on uplands

This association consists of soils on broad flats, summits, and side slopes on upland till plains. The major soils formed under mixed forest and prairie vegetation. Slopes range from 0 to 5 percent.

This association makes up about 26 percent of the county. It is about 37 percent Hoyleton soils, 21 percent Darmstadt soils, 20 percent Cisne soils, and 22 percent minor soils (fig. 2).

The somewhat poorly drained Hoyleton soils are on nearly level and gently sloping summits and side slopes. Typically, the surface layer is very dark gray, friable silt loam about 9 inches thick. The subsurface layer is brown, friable silt loam about 6 inches thick. The subsoil is about 30 inches thick. The upper part of the subsoil is brown, mottled, firm silty clay. The next part is grayish brown, mottled, firm silty clay loam. The lower part is light gray, mottled, firm silty clay loam. The substratum to a depth of 60 inches is light brownish gray and light gray, mottled, firm silty clay loam.

The somewhat poorly drained Darmstadt soils are on nearly level and gently sloping summits and side slopes. Typically, the surface layer is dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam about 6 inches thick. The subsoil is about 38 inches thick. The upper part of the subsoil is light olive brown, mottled, firm silty clay loam. The next part is light brownish gray, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm clay loam. The substratum to a depth of 60 inches is light brownish gray, mottled, firm clay loam.

The poorly drained Cisne soils are on nearly level upland summits. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is dark grayish brown and grayish brown, mottled, friable silt loam about 11 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is light brownish gray and grayish brown, mottled, firm silty clay. The next part is dark grayish brown, mottled, firm silty clay loam. The lower part is light gray, mottled, firm silt loam. A buried surface layer of dark gray, mottled silty clay loam is within a depth of 60 inches.

Minor in this association are the poorly drained

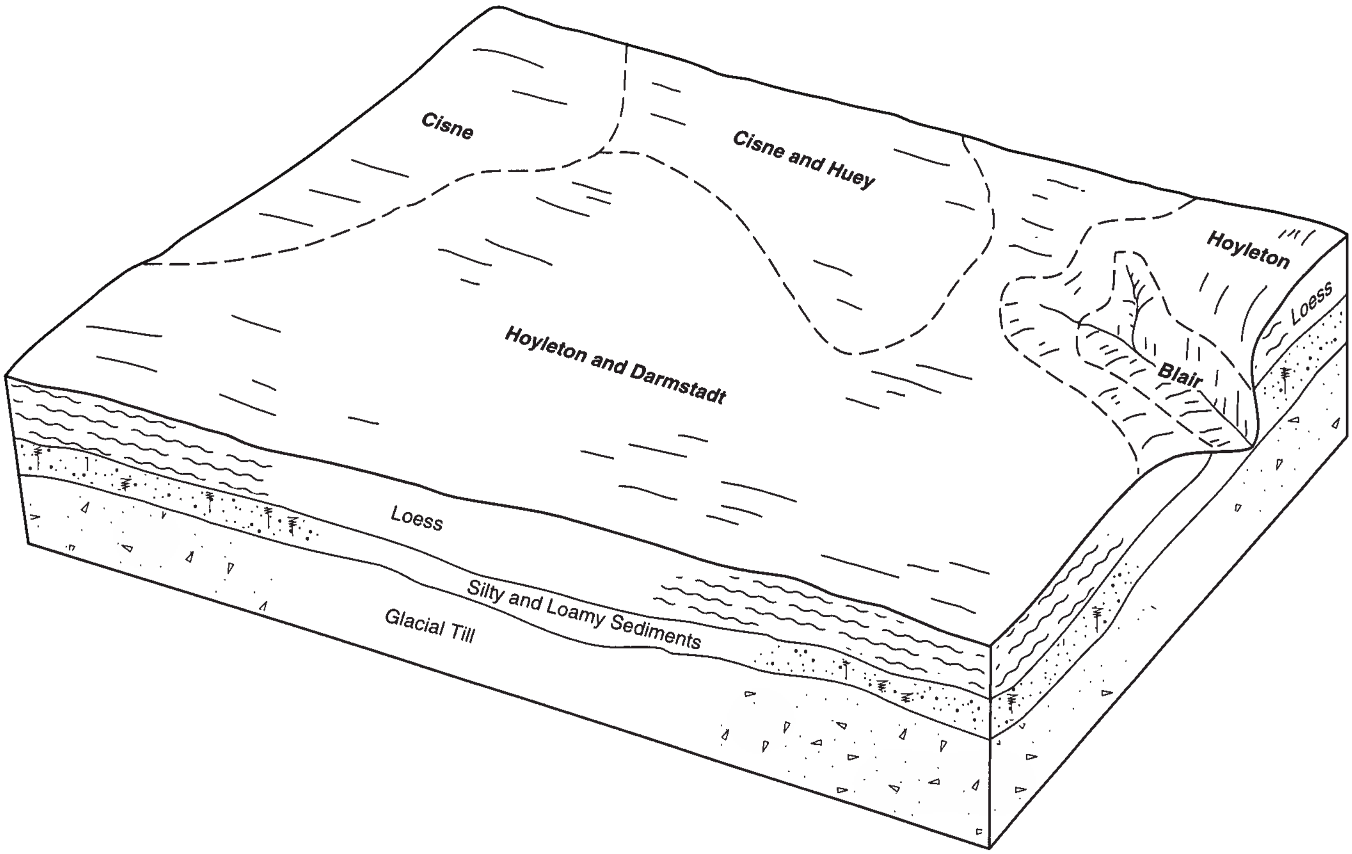

Figure 2.—Typical pattern of soils and parent material in the Hoyleton-Darmstadt-Cisne association.

Huey and Newberry soils, the somewhat poorly drained Blair soils, and the moderately well drained Pike soils. Huey soils are lower on the landscape than the Darmstadt soils. Newberry soils are in slight depressions below the Cisne soils and contain less clay in the subsoil. Blair soils are on side slopes. Pike soils are much higher on the landscape and more sloping than the other soils in the association.

Most areas of this association are used for cultivated crops. A few areas are used for hay and pasture. The major soils are well suited or moderately suited to cultivated crops and to hay and pasture. The major management concerns are wetness and the hazard of erosion. A high content of sodium in the Darmstadt soils results in moisture stress during dry periods and excess moisture during wet periods. The sodium restricts the availability and uptake of some plant nutrients.

This association generally is poorly suited to dwellings and to septic tank absorption fields. The seasonal high water table, the shrink-swell potential, and the slow or very slow permeability are limitations that affect these uses.

2. Oconee-Cowden-Darmstadt Association

Nearly level and gently sloping, somewhat poorly drained and poorly drained, slowly permeable and very slowly permeable, silty soils formed in loess or in loess and loamy sediments; on uplands

This association consists of soils on broad flats on upland till plains. The major soils formed under mixed forest and prairie vegetation. Slopes range from 0 to 5 percent.

This association makes up about 22 percent of the county. It is about 34 percent Oconee soils, 20 percent Cowden soils, 16 percent Darmstadt soils, and 30 percent minor soils.

The somewhat poorly drained Oconee soils are on nearly level and gently sloping summits and shoulder slopes. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is light brownish gray, friable silt loam about 9 inches thick. The subsoil is mottled, firm silty clay loam about 29 inches thick. The upper part of the subsoil is brown and dark grayish brown, and the lower part is light brownish gray. The substratum to a

depth of 60 inches is light brownish gray, mottled, firm silt loam.

The poorly drained Cowden soils are on nearly level upland summits. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is gray and grayish brown, mottled, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of the subsoil is grayish brown, mottled, firm silty clay. The next part is light brownish gray and gray, firm silty clay. The lower part is light brownish gray, mottled, firm silt loam.

The somewhat poorly drained Darmstadt soils are on nearly level and gently sloping summits and head slopes. Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 3 inches thick. The subsoil is mottled, firm silty clay loam about 42 inches thick. The upper part of the subsoil is brown, and the lower part is grayish brown. The substratum to a depth of 60 inches is light brownish gray, mottled, firm silty clay loam.

Minor in this association are the somewhat poorly drained Iva soils, the moderately well drained Muren soils, and the poorly drained Piasa soils. Iva soils are similar to the Oconee soils but have a lighter colored surface layer and have less clay in the subsoil. Muren soils are higher on the landscape than Oconee the soils, are more sloping, have a lighter colored surface layer, and have less clay in the subsoil. Piasa soils are in landscape positions similar to those of the Cowden soils and have a high content of sodium in the subsoil.

Most areas of this association are used for cultivated crops. A few areas are used for hay and pasture. The major soils are well suited or moderately suited to cultivated crops and to hay and pasture. The major management concerns are wetness and the hazard of erosion. A high content of sodium in the Darmstadt soils results in moisture stress during dry periods and excess moisture during wet periods. The sodium restricts the availability and uptake of some plant nutrients.

This association generally is poorly suited to dwellings and septic tank absorption fields. The seasonal high water table, the shrink-swell potential, and the slow or very slow permeability are limitations that affect these uses.

3. Herrick-Virden-Piasa Association

Nearly level, somewhat poorly drained and poorly drained, moderately slowly permeable and very slowly permeable, silty soils formed in loess; on uplands

This association consists of soils on broad summits on upland till plains. The major soils formed under prairie vegetation. Slopes range from 0 to 2 percent.

This association makes up about 8 percent of the county. It is about 32 percent Herrick soils, 27 percent Virden soils, 18 percent Piasa soils, and 23 percent minor soils (fig. 3).

The somewhat poorly drained Herrick soils are on summits above the Virden soils. Typically, the surface layer is very dark gray, friable silt loam about 13 inches thick. The subsurface layer is very dark gray, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of the subsoil is dark yellowish brown, very firm silty clay. The next part is olive brown and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm silt loam.

The poorly drained Virden soils are lower on the landscape than the Herrick soils. Typically, the surface soil is very dark gray, friable silt loam and silty clay loam about 14 inches thick. The subsoil is mottled, firm silty clay loam about 30 inches thick. The upper part of the subsoil is dark grayish brown, the next part is grayish brown, and the lower part is light brownish gray. The substratum to a depth of 60 inches is light brownish gray, mottled, firm silt loam and silty clay loam.

The poorly drained Piasa soils are in landscape positions similar to those of the Virden soils. They have a high content of sodium in the subsoil. Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is dark gray, friable silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part of the subsoil is dark grayish brown, mottled, firm silty clay loam. The lower part is dark grayish brown, mottled, firm silty clay loam and silt loam.

Minor in this association are the moderately well drained Harrison soils and the somewhat poorly drained Darmstadt and Oconee soils. Harrison soils are higher on the landscape than the Herrick soils. Darmstadt soils are on slight rises above the Piasa soils. They contain less clay in the subsoil than the Piasa soils. Oconee soils are in landscape positions

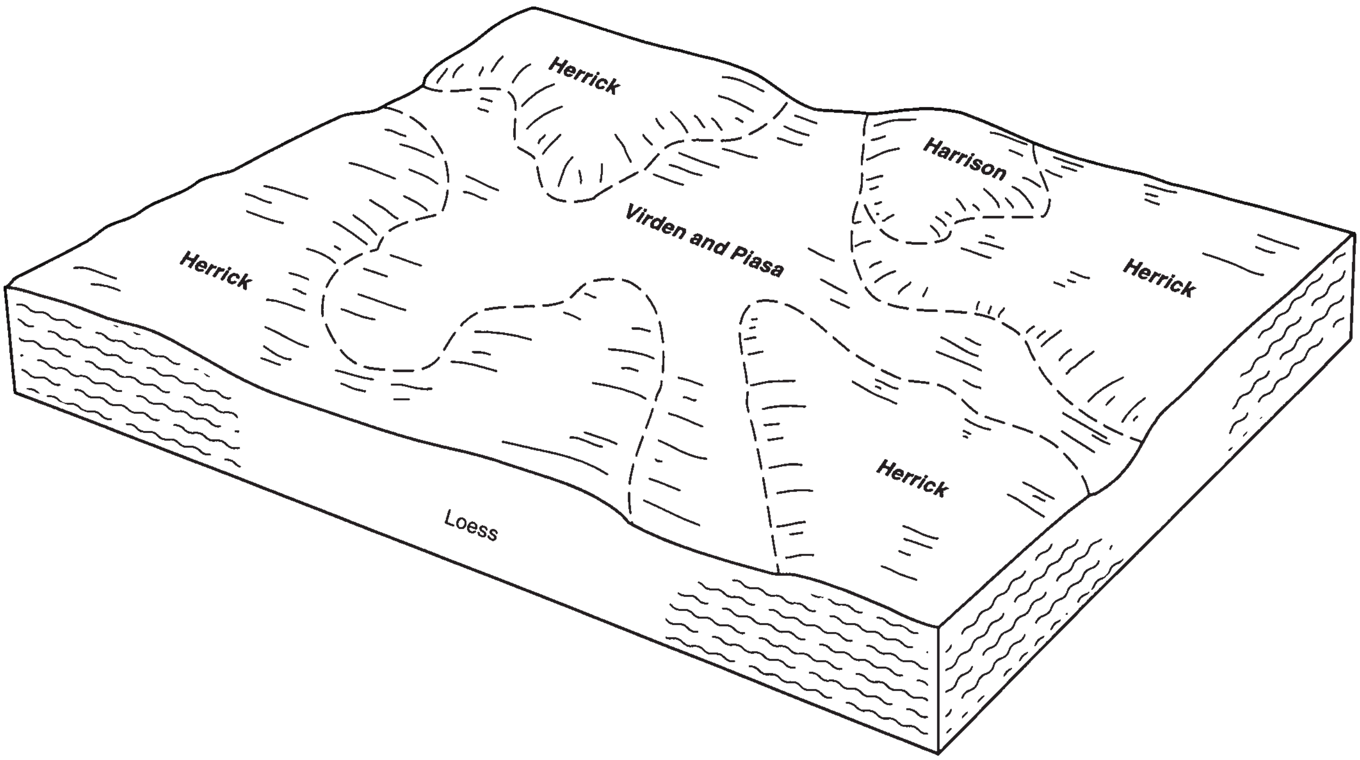

Figure 3.—Typical pattern of soils and parent material in the Herrick-Virden-Piasa association.

similar to those of the Herrick soils. Their surface layer is thinner than that of the Herrick soils.

Most areas of this association are used for cultivated crops. A few areas are used for hay and pasture. The major soils generally are well suited to cultivated crops and moderately suited to hay and pasture. The major management concerns are wetness in all three soils and a high content of sodium in the subsoil of the Piasa soils.

The major soils are generally unsuited to septic tank absorption fields and to dwellings because of the seasonal high water table.

4. Blair-Muren-Iva Association

Nearly level to strongly sloping, somewhat poorly drained and moderately well drained, moderately slowly permeable and moderately permeable, silty soils formed in water-worked sediments and glacial till or in loess; on uplands

This association consists of soils on side slopes, shoulder slopes, and summits on upland till plains. The major soils formed under forest vegetation. Slopes range from 0 to 15 percent.

This association makes up about 11 percent of the county. It is about 32 percent Blair soils, 22 percent Muren soils, 21 percent Iva soils, and 25 percent minor soils (fig. 4).

The somewhat poorly drained Blair soils are on moderately sloping and strongly sloping side slopes. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of the subsoil is brown, friable silt loam. The next part is yellowish brown, brown, and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm loam.

The moderately well drained Muren soils are on gently sloping summits and shoulder slopes. Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of the subsoil is dark yellowish brown, brown, and yellowish brown, mottled, friable silty clay loam. The lower part is brown, mottled, firm silt loam.

The somewhat poorly drained Iva soils are on nearly level summits above the Muren soils. Typically, the surface layer is dark grayish brown, friable silt loam about 11 inches thick. The subsurface layer is brown, mottled, friable silt loam about 6 inches thick. The subsoil is about 31 inches thick. The upper part of the subsoil is brown, mottled, firm silty clay loam. The

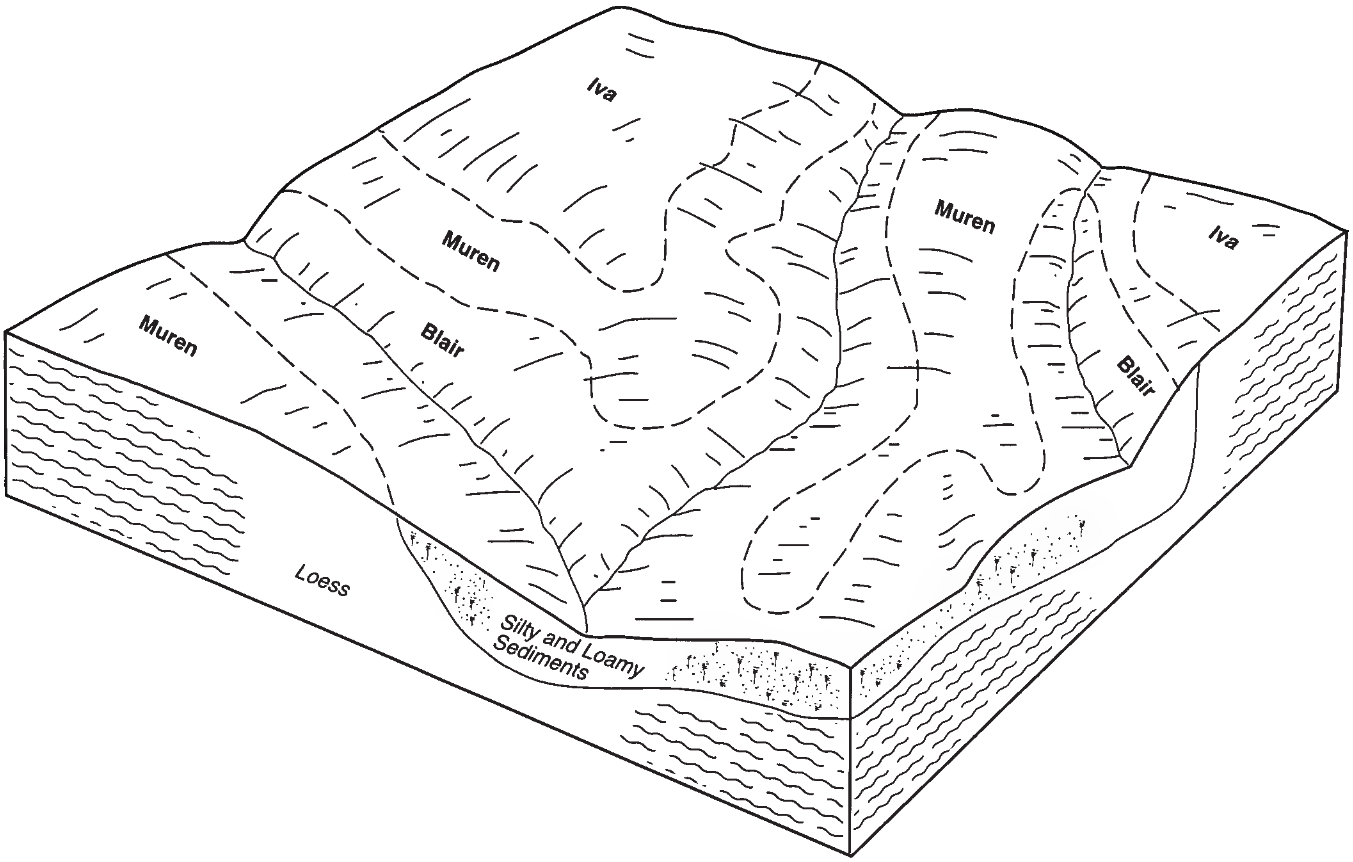

Figure 4.—Typical pattern of soils and parent material in the Blair-Muren-Iva association.

lower part is grayish brown, mottled, firm silt loam. The substratum to a depth of 60 inches is brown, mottled, firm silt loam.

Minor in this association are the somewhat poorly drained Darmstadt and Herrick soils and the poorly drained Piasa soils. Darmstadt and Herrick soils are in landscape positions similar to those of the Iva soils. Darmstadt soils have a high content of sodium in the subsoil. Herrick soils have a thick, dark surface layer. Piasa soils are in slight depressions below the Iva soils and have a dark surface layer and a high content of sodium in the subsoil.

Most areas of this association are used for cultivated crops. A few areas are used for hay and pasture. The major soils are well suited or moderately suited to cultivated crops and to hay and pasture. The major management concerns are wetness and the hazard of erosion.

This association generally is poorly suited to dwellings and septic tank absorption fields. The wetness, the shrink swell potential, and the restricted permeability are management concerns. The slope also is a limitation in areas of the Blair soils.

5. Bluford-Hickory-Blair Association

Nearly level to steep, somewhat poorly drained and moderately well drained, moderately slowly permeable, moderately permeable, and slowly permeable, silty and loamy soils formed in loess, glacial till, and water-worked sediments and glacial till; on uplands

This association consists of soils on summits and side slopes on upland till plains. The major soils formed under forest vegetation. Slopes range from 0 to 30 percent.

This association makes up about 10 percent of the county. It is about 37 percent Bluford soils, 18 percent Hickory soils, 17 percent Blair soils, and 28 percent minor soils (fig. 5).

The somewhat poorly drained Bluford soils are on nearly level and gently sloping summits above the Hickory soils. Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The subsurface layer is light brownish gray, mottled, firm silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of

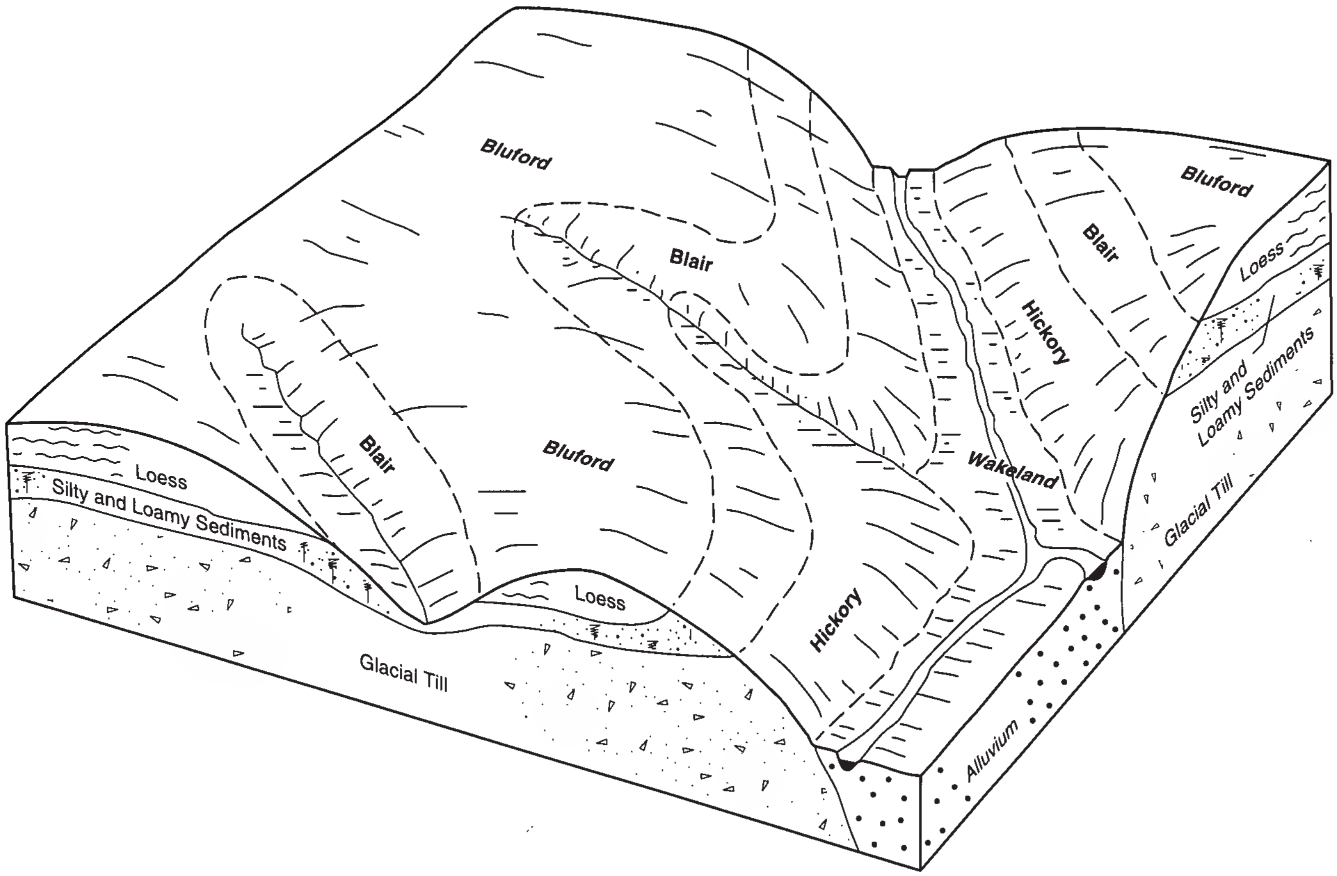

Figure 5.—Typical pattern of soils and parent material in the Bluford-Hickory-Blair association.

the subsoil is brown and dark yellowish brown, mottled, firm silty clay loam and silty clay. The lower part is brown and dark yellowish brown, mottled, firm and brittle silty clay loam and silt loam.

The moderately well drained Hickory soils are on strongly sloping to steep side slopes below the Bluford soils. Typically, the surface layer is dark grayish brown, friable loam about 6 inches thick. The subsurface layer is brown, friable silt loam about 3 inches thick. The subsoil is dark yellowish brown and yellowish brown, mottled, firm clay loam about 40 inches thick. The substratum to a depth of 60 inches is yellowish brown, mottled, very firm loam.

The somewhat poorly drained Blair soils are on moderately sloping and strongly sloping side slopes below the Bluford soils and above the Hickory soils. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part of the subsoil is brown, friable silt loam. The next part is yellowish brown, brown, and grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, firm loam.

Minor in this association are the moderately well drained Ava soils, the somewhat poorly drained Wakeland soils, and the poorly drained Cisne and Wynoose soils. Ava soils are on the narrower summits. Wakeland soils are on flood plains. Cisne and Wynoose soils are slightly lower on the landscape than the Bluford soils. Cisne soils have a dark colored surface layer.

Most areas of this association are used for cultivated crops. A few areas are used for hay and pasture. The soils in most of the nearly level and gently sloping areas are well suited to cultivated crops. The more sloping soils are better suited to hay and pasture. The major management concerns are wetness and the hazard of erosion.

This association generally is poorly suited to dwellings and septic tank absorption fields. The wetness, the shrink swell potential, and the restricted permeability are management concerns. The slope

also is a limitation in areas of the Blair and Hickory soils.

6. Wakeland-Birds-Beaucoup Association

Nearly level, somewhat poorly drained and poorly drained, moderately permeable and moderately slowly permeable, silty soils formed in alluvium or slackwater sediments; on frequently flooded flood plains

This association consists of soils on flood plains along streams. Slopes range from 0 to 2 percent.

This association makes up about 18 percent of the county. It is about 31 percent Wakeland soils, 29 percent Birds soils, 16 percent Beaucoup soils, and 24 percent minor soils.

The somewhat poorly drained Wakeland soils are on higher on the flood plains than the Birds soils. Typically, the surface layer is dark grayish brown, mottled, friable silt loam about 7 inches thick. The substratum to a depth of 60 inches or more is grayish brown, mottled, friable silt loam.

The poorly drained Birds soils are lower on the flood plains than the Wakeland soils. Typically, the surface layer is dark grayish brown, mottled, friable silt loam about 7 inches thick. The substratum to a depth of 60 inches or more is gray, mottled, friable silt loam.

The poorly drained Beaucoup soils are in positions on the flood plains similar to those of the Birds soils. Typically, the surface soil is very dark gray and very dark grayish brown, mottled, friable silt loam and silty clay loam about 14 inches thick. The subsoil to a depth of 60 inches or more is dark gray and gray, mottled, friable silty clay loam.

Minor in this association are the well drained Alvin soils and the poorly drained Blackoar and Petrolia soils. Alvin soils are closer to streams than the Wakeland soils and contain more sand. Blackoar soils are in landscape positions similar to those of the Beaucoup soils. They contain less clay throughout the solum than the Beaucoup soils. Petrolia soils are in landscape positions similar to those of the Birds soils. They contain more clay throughout the solum than the Birds soils.

Most areas of this association are used for cultivated crops. Some areas are used as native woodland or as wetland wildlife habitat. The major soils generally are well suited or moderately suited to cropland. They are generally unsuited to small grain, hay, and pasture because of the hazard of flooding. They generally are well suited to woodland and to wetland wildlife habitat. The major management concerns are frequent flooding and wetness.

This association is generally unsuited to septic tank absorption fields and dwellings because of the hazard of flooding and the seasonal high water table.

7. Wagner-Racoon-Lakaskia Association

Nearly level, poorly drained, very slowly permeable and slowly permeable, silty soils formed in lacustrine sediments, loess and local alluvium, or loess and lacustrine sediments; on terraces

This association consists of soils at various terrace levels. It is adjacent to flood plains. Slopes range from 0 to 2 percent.

This association makes up about 5 percent of the county. It is about 27 percent Wagner and similar soils, 21 percent Racoon soils, 13 percent Lakaskia soils, and 39 percent minor soils.

The poorly drained Wagner soils are on terraces above the Racoon soils. Typically, the surface layer is very dark grayish brown, friable silt loam about 9 inches thick. The subsurface layer is grayish brown, mottled, firm silt loam about 10 inches thick. The subsoil is grayish brown, firm silty clay loam about 22 inches thick. The substratum to a depth of 60 inches is grayish brown, mottled, firm silty clay loam.

The poorly drained Racoon soils are on low terraces slightly above the flood plains. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is grayish brown and light brownish gray, friable silt loam about 17 inches thick. The subsoil is mottled silty clay loam about 22 inches thick. The upper part of the subsoil is light brownish gray and friable, and the lower part is grayish brown and firm. The substratum to a depth of 60 inches is grayish brown, mottled, firm silty clay loam.

The poorly drained Lakaskia soils are on terraces above the Racoon soils and at the same level as the Wagner soils or below the Wagner soils. Typically, the surface layer is very dark gray, friable silt loam about 13 inches thick. The subsoil is mottled, firm silty clay loam and silty clay about 37 inches thick. The upper part of the subsoil is dark grayish brown, and the lower part is grayish brown. The substratum to a depth of 60 inches is gray, mottled, firm silty clay loam.

Minor in this association are the somewhat poorly drained Bartelso and Hurst soils and the poorly drained Okaw soils. Bartelso and Hurst soils are in landscape positions similar to those of the Lakaskia and Wagner soils. Okaw soils are similar to the Wagner soils but have a lighter colored surface layer.

Most areas of this association are used for cultivated crops. Some areas are used as native woodland. The major soils are well suited or moderately suited to cultivated crops, small grain, and

hay and pasture. The major management concerns are the hazard of flooding and wetness.

This association is generally unsuited to septic tank absorption fields and dwellings because of the seasonal high water table and the hazard of flooding.

Broad Land Use Considerations

The soils in Clinton County vary widely in their suitability for major land uses.

More than 72 percent of the acreage in the county is used for crops, dominantly soybeans, corn, and wheat. Much of the acreage used for wheat is double cropped with soybeans. In most areas of all the associations, the soils are well suited or moderately suited to cultivated crops. Wetness is the major limitation on the cropland in all of the associations. In some areas of associations 1, 2, and 3, a high content of sodium in the subsoil also is a limitation. Erosion is the major hazard in associations 4 and 5. Associations 6 and 7 are subject to flooding.

Approximately 9 percent of the county is used as hayland or pasture. Associations 1 to 5 all have soils that are well suited or moderately suited to hay and pasture. In some areas of associations 4 and 5, the soils are better suited to hay and pasture than to cultivated crops.

Approximately 14 percent of the county is used as woodland. Associations 4 to 7 have the largest areas of woodland. In some areas of these associations, the soils are well suited to woodland.

Private sewage systems are needed throughout much of the county. In all of the associations, wetness is a moderate or severe limitation if these systems are installed. In associations 4 and 5, the slope also is a limitation. Associations 6 and 7 are generally unsuited to septic tank absorption fields because of wetness and flooding.

The suitability of the soils in Clinton County for recreational uses ranges from good to poor. Associations 4 and 5 have soils that are well suited or moderately suited to these uses. The limitations in these associations include wetness and slope. The other associations are generally unsuited to recreational uses because of wetness or flooding.

The suitability for wildlife habitat generally is good throughout the county. Associations 1 to 6 generally are well suited to openland wildlife habitat. Associations 4 to 7 generally are well suited to woodland wildlife habitat. Associations 6 and 7 generally are well suited to wetland and woodland wildlife habitat.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series.* Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases.* Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Blair silt loam, 5 to 10 percent slopes, eroded, is a phase of the Blair series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Hoyleton-Darmstadt complex, 0 to 2 percent slopes, is an example.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Urban land is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

2—Cisne silt loam

Composition

Cisne and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and loamy sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 20 inches—dark grayish brown and grayish brown, mottled, friable silt loam

Subsoil:
20 to 29 inches—light brownish gray, mottled, firm silty clay
29 to 38 inches—grayish brown, mottled, firm silty clay
38 to 42 inches—dark grayish brown, mottled, firm silty clay loam
42 to 51 inches—light gray, mottled, firm silt loam

Substratum:
51 to 60 inches—dark gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Sodium-affected soils on landscapes similar to those of the Cisne soil
- Small areas that are ponded

Similar inclusions:
- The poorly drained Newberry soils in slight depressions
- Soils that have a lighter colored surface layer
- Somewhat poorly drained soils

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas are puddled after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4W

3A—Hoyleton silt loam, 0 to 2 percent slopes

Composition

Hoyleton and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 240 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 18 inches—brown and pale brown, friable silt loam

Subsoil:
18 to 30 inches—brown, mottled, firm silty clay
30 to 41 inches—light brownish gray, mottled, friable silty clay loam
41 to 54 inches—brown, mottled, friable silt loam

Substratum:
54 to 60 inches—brown, mottled, firm clay loam

Inclusions

Contrasting inclusions:
- The poorly drained Cisne and Newberry soils in slight depressions
- The somewhat poorly drained Darmstadt soils on landscapes similar to those of the Hoyleton soil

Similar inclusions:
- Soils that have a lighter colored surface layer
- Moderately well drained soils

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains

around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4A

3B2—Hoyleton silt loam, 2 to 5 percent slopes, eroded

Composition

Hoyleton and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy sediments over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:
7 to 12 inches—brown, friable silt loam

Subsoil:
12 to 32 inches—brown, mottled, firm silty clay loam
32 to 37 inches—grayish brown, mottled, firm clay loam
37 to 52 inches—gray, mottled, firm clay loam

Substratum:
52 to 60 inches—gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
- Severely eroded areas
- The somewhat poorly drained Darmstadt soils on landscapes similar to those of the Hoyleton soil

Similar inclusions:
- Soils that have a lighter colored surface layer
- Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Wetness delays planting in some years, and some areas may be seepy. Surface ditches and waterways reduce the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and

foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 4A

5C2—Blair silt loam, 5 to 10 percent slopes, eroded

Composition

Blair and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty water-worked sediments and glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable silt loam

Subsoil:
6 to 9 inches—brown, friable silt loam
9 to 57 inches—brown, yellowish brown, and grayish brown, mottled, firm silty clay loam
57 to 60 inches—grayish brown, mottled, firm loam

Inclusions

Contrasting inclusions:
- Severely eroded areas
- Sodium-affected soils on landscapes similar to those of the Blair soil

Similar inclusions:
- Soils that have less clay in the subsoil
- Moderately well drained soils

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay (fig. 6)

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited to dwellings without basements and poorly suited to dwellings with basements
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the

Figure 6.—Hay production on Blair silt loam, 5 to 10 percent slopes, eroded.

base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability and the seasonal high water table. Enlarging the absorption area improves the capacity of the system to absorb liquid waste. Installing underground drains lowers the water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 4A

5C3—Blair silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

Blair and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty water-worked sediments and glacial till
Runoff: Medium
Available water capacity: High

Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Tilth: Affected by crusting or puddling of the surface layer after hard rains
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—dark brown, friable silty clay loam

Subsoil:
4 to 9 inches—brown, firm silty clay loam
9 to 30 inches—brown and grayish brown, mottled, firm silty clay loam
30 to 60 inches—light brownish gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Areas of the more sloping Hickory soils
- Sodium-affected soils on landscapes similar to those of the Blair soil
- Moderately eroded soils on landscapes similar to those of the Blair soil and in steeper areas

Similar inclusions:
- Soils that have more clay in the subsoil
- Soils that have more sand in the subsoil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and further erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited to dwellings without basements and poorly suited to dwellings with basements
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability, and the seasonal high water table. Enlarging the absorption area improves the capacity of the system to absorb liquid waste. Installing underground drains lowers the water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 4A

5D3—Blair silty clay loam, 10 to 15 percent slopes, severely eroded

Composition

Blair and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty water-worked sediments and glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Tilth: Affected by crusting or puddling of the surface layer after hard rains
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—brown, friable silty clay loam

Subsoil:
4 to 52 inches—yellowish brown, brown, and grayish brown, mottled, firm silty clay loam

Substratum:
52 to 60 inches—grayish brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Areas of the more sloping Hickory soils

Similar inclusions:
- Soils that have more clay in the subsoil
- Soils that have more sand in the subsoil
- Moderately eroded soils on landscapes similar to those of the Blair soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
A cover of grasses and legumes improves tilth and helps to control erosion. Seedbed preparation is difficult on these severely eroded side slopes. A no-till method of seeding or pasture renovation helps to establish forage species and reduces the hazard of erosion. The plants should not be grazed or clipped until they are sufficiently established. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition.

Dwellings

Suitability: Moderately suited to dwellings without basements and poorly suited to dwellings with basements
Management considerations:
The seasonal high water table, the shrink-swell potential, and the slope are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. Some land shaping by cutting and filling helps to overcome the slope. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability, the seasonal high water table, and the slope. Enlarging the absorption area improves the capacity of the system to absorb liquid waste. Installing underground drains lowers the water table. Installing the filter lines on the contour helps to distribute the liquid waste and helps to control seepage. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: VIe
Woodland ordination symbol: 4A

7C3—Atlas clay loam, 5 to 10 percent slopes, severely eroded

Composition

Atlas and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 40 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 2 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Tilth: Affected by crusting or puddling of the surface layer after hard rains
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—brown, friable clay loam

Subsoil:
4 to 55 inches—dark yellowish brown and grayish brown, firm clay loam
55 to 60 inches—grayish brown, firm loam

Inclusions

Contrasting inclusions:
- Small areas of the moderately well drained Hickory soils on the steeper side slopes below the Atlas soil
- Small areas of the fine-silty Blair soils on side slopes above the Atlas soil

Similar inclusions:
- Moderately eroded soils that have less clay in the surface soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 4C

8D2—Hickory loam, 10 to 15 percent slopes, eroded

Composition

Hickory and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 80 acres
Major use: Woodland or pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess and glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable loam

Subsoil:
6 to 23 inches—dark yellowish brown, firm clay loam
23 to 48 inches—yellowish brown, mottled, firm clay loam

Substratum:
48 to 60 inches—light olive brown, mottled, firm loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Atlas soils, which have more clay in the subsoil than the Hickory soil
- Small areas of the somewhat poorly drained Blair soils, which have less sand in the subsoil than the Hickory soil

Similar inclusions:
- Severely eroded soils
- Soils that have a high content of sodium in the lower part of the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Woodland

Suitability: Well suited
Management considerations:
Plant competition is a management concern. It affects new seedlings of desirable species. The undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Fire prevention is needed to protect both young and old trees and the leaf mulch.

Wildlife habitat

Suitability: Well suited to woodland wildlife habitat
Management considerations:
The wooded areas of this soil provide good habitat for woodland wildlife. Measures that exclude livestock from these areas help to prevent depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a

variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

Dwellings

Suitability: Moderately suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. Some land shaping by cutting and filling helps to overcome the slope. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderate permeability, the slope, and wetness. Enlarging the absorption area improves the capacity of the system to absorb liquid waste. Installing the filter lines on the contour helps to distribute the liquid waste and helps to control seepage. Installing underground drains lowers the water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 5A

8D3—Hickory clay loam, 10 to 15 percent slopes, severely eroded

Composition

Hickory and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 80 acres
Major use: Cropland or pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Tilth: Affected by crusting or puddling of the surface layer after hard rains
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 2 inches—brown, friable clay loam

Subsoil:
2 to 60 inches—dark yellowish brown, mottled, firm clay loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Atlas soils, which have more clay in the subsoil than the Hickory soil
- Small areas of the somewhat poorly drained Blair soils, which have less sand in the subsoil than the Hickory soil

Similar inclusions:
- Moderately eroded soils
- Soils that have a high content of sodium in the lower part of the subsoil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, and alfalfa
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Woodland

Suitability: Well suited
Management considerations:
Plant competition is a management concern. It affects new seedlings of desirable species. The undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Fire prevention is needed to protect both young and old trees and the leaf mulch.

Wildlife habitat

Suitability: Well suited to woodland wildlife habitat
Management considerations:
The wooded areas of this soil provide good habitat for woodland wildlife. Measures that exclude livestock from these areas help to prevent depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

Dwellings

Suitability: Moderately suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the slope are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. Some land shaping by cutting and filling helps to overcome the slope. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderate permeability, the seasonal high water table, and the slope. Enlarging the absorption area improves the capacity of the system to absorb liquid waste. Installing the filter lines on the contour helps to distribute the liquid waste and helps to control seepage. Installing underground drains lowers the water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 5A

8F—Hickory loam, 15 to 30 percent slopes

Composition

Hickory and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 80 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess and glacial till
Runoff: Very rapid
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable loam

Subsurface layer:
6 to 9 inches—brown, friable silt loam

Subsoil:
9 to 16 inches—dark yellowish brown, firm clay loam

16 to 49 inches—yellowish brown and dark yellowish brown, mottled, firm and very firm clay loam

Substratum:

49 to 60 inches—yellowish brown, mottled, very firm loam

Inclusions

Contrasting inclusions:

- Small areas of the somewhat poorly drained Atlas soils on side slopes above the Hickory soil
- Small areas of soils on flood plains below the Hickory soil

Similar inclusions:

- Soils that have more clay in the surface layer because of severe erosion

Use and Management

Pasture and Hay

Suitable species: Bromegrass, orchardgrass, tall fescue, and alfalfa

Management considerations:

Erosion is a hazard. A permanent cover of pasture plants helps to control erosion and maintain tilth. Measures that reduce the hazard of erosion are needed when grasses and legumes are established. In areas where the pasture is already established, seeding legumes on the contour with a no-till seeder and applying the needed fertilizer improve forage quality. In newly seeded areas fertilizer should be added according to the results of soil tests and grasses and legumes should be seeded with as little disturbance of the existing vegetative cover as possible. In some areas mulching may be needed. The plants should not be grazed or clipped until they are sufficiently established. Proper stocking rates, rotation grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Suitability: Moderately suited

Management considerations:

The hazard of erosion and an equipment limitation are management concerns because of the slope. Plant competition also is a management concern. It affects new seedlings of desirable species. Logging roads and skid trails should be established on the contour or as near the contour as possible. On the steeper slopes, logs or trees should be skidded uphill with a cable and winch. Firebreaks should be the grass type. Areas that are bare because of logging operations should be seeded to grass or to a grass-legume mixture after the logging operations have been completed. The use of machinery should be limited to periods when the soil is firm enough to support the equipment. The undesirable vegetation in openings created by timber harvesting can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Fire prevention is needed to protect both young and old trees and the leaf mulch.

Wildlife habitat

Suitability: Well suited to woodland wildlife habitat

Management considerations:

The wooded areas of this soil provide good habitat for woodland wildlife. Measures that exclude livestock from these areas help to prevent depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIe

Woodland ordination symbol: 5R

12—Wynoose silt loam

Composition

Wynoose and similar soils: 85 to 95 percent

Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands

Landform: Till plains

Landform position: Summits

Shape of areas: Irregular

Size of areas: 5 to 100 acres

Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained

Permeability: Very slow

Parent material: Loess and loamy sediments over a paleosol that formed in glacial till

Runoff: Very slow

Available water capacity: High

Seasonal high water table: Within a depth of 2 feet

Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 17 inches—light brownish gray, friable silt loam

Subsoil:
17 to 41 inches—grayish brown, mottled, firm silty clay loam
41 to 49 inches—light brownish gray, mottled, firm silt loam

Substratum:
49 to 60 inches—dark grayish brown, mottled, firm loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Bluford and Hoyleton soils on low, broad ridges above the Wynoose soil
• Small areas that are ponded

Similar inclusions:
• Cisne soils, which have a darker surface soil than that of the Wynoose soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of very slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4W

13A—Bluford silt loam, 0 to 2 percent slopes

Composition

Bluford and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow in upper part of the soil and slow in lower part
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till

Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Subsurface layer:
7 to 12 inches—light brownish gray, mottled, firm silt loam

Subsoil:
12 to 36 inches—brown and dark yellowish brown, mottled, firm silty clay loam and silty clay
36 to 60 inches—brown and dark yellowish brown, mottled, firm, slightly brittle silty clay loam and silt loam

Inclusions

Contrasting inclusions:
- The poorly drained Wynoose and Cisne soils in slight depressions

Similar inclusions:
- Hoyleton soils, which have a darker surface layer than that of the Bluford soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table is a severe limitation, and the shrink-swell potential is a moderate limitation. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4A

13B2—Bluford silt loam, 2 to 5 percent slopes, eroded

Composition

Bluford and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Shoulders
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained

Permeability: Moderately slow in upper part of the soil and slow in lower part
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 15 inches—brown, mottled, friable silt loam

Subsoil:
15 to 21 inches—brown and grayish brown, mottled, firm silty clay loam
41 to 48 inches—a paleosol of dark grayish brown, mottled, firm silt loam
48 to 60 inches—a paleosol of grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The poorly drained Wynoose soils in depressions
- Soils that have less clay in the subsoil than the Bluford soil

Similar inclusions:
- Hoyleton soils, which have a darker surface layer than that of the Bluford soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Wetness delays planting in some years, and some areas may be seepy. Surface ditches and waterways reduce the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table is a severe limitation and the shrink-swell potential is a moderate limitation. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 4A

14B—Ava silt loam, 2 to 5 percent slopes

Composition

Ava and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders

Shape of areas: Long and narrow
Size of areas: 5 to 80 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part of the soil and very slow in the lower part
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:
6 to 10 inches—brown, friable silt loam

Subsoil:
10 to 20 inches—yellowish brown, firm silty clay loam
20 to 27 inches—yellowish brown, mottled, firm silty clay loam
27 to 49 inches—grayish brown, mottled, very firm, brittle silty clay loam and silt loam

Substratum:
49 to 60 inches—yellowish brown, mottled, friable loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Blair soils on side slopes below the Ava soil

Similar inclusions:
- Small areas of soils that have more clay in the surface soil because of severe erosion
- Small areas of the moderately well drained Hickory soils, which have more sand in the subsoil than the Ava soil and are more sloping

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited to dwellings without basements and poorly suited to dwellings with basements
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe

Woodland ordination symbol: 4A

46A—Herrick silt loam, 0 to 2 percent slopes

Composition

Herrick and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 350 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 13 inches—very dark gray, friable silt loam

Subsurface layer:
13 to 18 inches—very dark gray, friable silt loam

Subsoil:
18 to 23 inches—dark yellowish brown, very firm silty clay
23 to 51 inches—olive brown and grayish brown, mottled, firm silty clay loam
51 to 60 inches—grayish brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
• Small areas of the poorly drained Virden soils below the Herrick soil
• Small areas of the poorly drained Piasa soils, which have a high content of sodium near the surface

Similar inclusions:
• Small areas of soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

50—Virden silt loam

Composition

Virden and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 150 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface soil:
0 to 14 inches—very dark gray, friable silt loam and silty clay loam

Subsoil:
14 to 44 inches—grayish brown, dark grayish brown, and light brownish gray, mottled, firm silty clay loam

Substratum:
44 to 60 inches—light brownish gray, mottled, firm silt loam and silty clay loam

Inclusions

Contrasting inclusions:
• Soils that have a high content of sodium in the lower part of the subsoil
• Small areas of soils that have a high content of sodium at the surface

Similar inclusions:
• Small areas of soils that have a thinner surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. A combination of surface ditches and land leveling helps to control ponding. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability, the seasonal high water table, and the ponding.

Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. A combination of surface ditches and land leveling helps to control ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

53D—Bloomfield fine sand, 10 to 15 percent slopes

Composition

Bloomfield and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: 5 to 80 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Somewhat excessively drained
Permeability: Rapid
Parent material: Wind-deposited sandy material
Runoff: Slow
Available water capacity: Low
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Low
Potential for frost action: Low

Typical Profile

Surface layer:
0 to 7 inches—dark brown and dark yellowish brown, loose fine sand

Subsurface layer:
7 to 42 inches—dark yellowish brown, loose fine sand

Subsoil:
42 to 60 inches—yellowish brown, loose medium and fine sand with bands of strong brown, friable loamy fine sand

Inclusions

Contrasting inclusions:
- Small areas of soils on flood plains
- Escarpments next to sand pits

Similar inclusions:
- Small areas of soils that have more clay and less sand in the subsoil
- Small disturbed areas of soils that have less surface soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
If this soil is used for corn, soybeans, or small grain, water erosion and soil blowing are hazards. Also, the low available water capacity and the fertility level are limitations. Such practices as conservation tillage, contour farming, and terracing help to control erosion and conserve moisture. Field windbreaks and a tillage system that leaves the surface rough help to control soil blowing. Returning crop residue to the soil or regularly adding other organic material helps to maintain tilth and improves fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Droughtiness is a limitation. It can be overcome by irrigation systems. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Woodland

Suitability: Moderately suited
Management considerations:
Seedling mortality is a management concern because the amount of sand in the soil limits the supply of available moisture. The seedling mortality rate can be reduced by planting species that are tolerant of droughty conditions, by selecting the larger seedlings for planting, and by eliminating all vegetation within 2 feet of the seedlings. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree

roots and to desirable young trees. Fire prevention is needed to protect both young and old trees and the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
The slope is a limitation. Cutting, filling, and land shaping help to overcome this limitation.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
The slope and a poor filtering capacity are limitations. The soil readily absorbs but does not adequately filter the effluent from septic tanks. The poor filtering capacity can result in the pollution of ground water. The filtering capacity can be improved if the site is leveled and filled or mounded with suitable material.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 4S

112—Cowden silt loam

Composition

Cowden and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 1,000 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 18 inches—gray and grayish brown, mottled, friable silt loam

Subsoil:
18 to 48 inches—grayish brown, light brownish gray, and gray, mottled, firm silty clay
48 to 60 inches—light brownish gray, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Oconee soils on the slightly higher parts of the landscape
- Small areas of soils that have a lighter colored surface soil
- Small areas that are ponded

Similar inclusions:
- Small areas of soils that have a thinner surface soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper

stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

113A—Oconee silt loam, 0 to 2 percent slopes

Composition

Oconee and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 250 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 18 inches—light brownish gray, friable silt loam

Subsoil:
18 to 33 inches—brown and dark grayish brown, mottled, firm silty clay loam
33 to 47 inches—light brownish gray, mottled, firm silty clay loam

Substratum:
47 to 60 inches—light brownish gray, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of the poorly drained Cowden soils in slight depressions

Similar inclusions:
- Some areas of soils that have a thinner surface layer
- Small areas of soils that have a lighter colored surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the

soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

113B2—Oconee silt loam, 2 to 5 percent slopes, eroded

Composition

Oconee and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Shape of areas: Irregular
Size of areas: 5 to 150 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsoil:
7 to 44 inches—dark yellowish brown and yellowish brown, mottled, firm silty clay loam
44 to 60 inches—brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of Darmstadt soils, which are affected by sodium

Similar inclusions:
- Soils that are more alkaline in the lower part of the subsoil
- Some areas of soils that have a thinner surface layer
- Some areas of soils that have a lighter colored surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Wetness delays planting in some years, and some areas may be seepy. Surface ditches and waterways reduce the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. The species that are tolerant of wetness should be selected for planting. Overgrazing

or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: None assigned

119D3—Elco silty clay loam, 10 to 15 percent slopes, severely eroded

Composition

Elco and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 50 acres
Major use: Pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately slow
Parent material: Loess and a paleosol that formed in glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2.5 to 4.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—dark brown, friable silty clay loam

Subsoil:
4 to 14 inches—dark yellowish brown, friable silty clay loam
14 to 36 inches—dark yellowish brown, mottled, friable silty clay loam and silt loam
36 to 60 inches—brown and grayish brown, mottled, friable clay loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Blair soils

Similar inclusions:
- Some areas that are moderately eroded
- Small areas of Hickory soils, which contain more sand than the Elco soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, and alfalfa
Management considerations:
Erosion is a hazard, particularly during the

establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the slope are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. Some land shaping by cutting and filling helps to overcome the slope. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the moderately slow permeability and the seasonal high water table. The slope is a moderate limitation. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. Installing the filter lines on the contour helps to distribute the liquid waste and helps to control seepage. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 4A

127B—Harrison silt loam, 2 to 5 percent slopes

Composition

Harrison and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 3 to 6 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface soil:
0 to 13 inches—very dark grayish brown and brown, friable silt loam

Subsoil:
13 to 21 inches—dark yellowish brown, firm silty clay loam
21 to 32 inches—brown, mottled, firm silty clay loam
32 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Darmstadt soils on the lower part of ridges

Similar inclusions:
- Soils that have a lighter colored surface soil
- Small areas that are moderately eroded

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Wetness delays planting in some years, and some areas may be seepy. Surface ditches and waterways reduce the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, and alfalfa
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the seasonal high water table. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: None assigned

165—Weir silt loam

Composition

Weir and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—dark gray, friable silt loam

Subsurface layer:
9 to 18 inches—light brownish gray, friable silt loam

Subsoil:
18 to 21 inches—light brownish gray, mottled, friable silty clay loam
21 to 30 inches—grayish brown, mottled, firm silty clay
30 to 52 inches—grayish brown, mottled, firm silty clay loam

Substratum:
52 to 60 inches—light brownish gray, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Soils that have sodium in the subsoil

Similar inclusions:
- Soils that have a darker surface layer
- Somewhat poorly drained soils
- Small areas of soils that have a high content of clay in the upper part of the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the

rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. A combination of surface ditches and land leveling helps to control ponding.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability, the seasonal high water table, and the ponding. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. A combination of surface ditches and land leveling helps to control ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4W

218—Newberry silt loam

Composition

Newberry and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and shallow, closed depressions
Shape of areas: Irregular
Size of areas: 5 to 150 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, mottled, friable silt loam

Subsurface layer:
9 to 17 inches—gray, mottled, friable silt loam

Subsoil:
17 to 53 inches—dark gray and gray, mottled, firm silty clay loam
53 to 60 inches—gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Oconee soils on small, low knolls
- Small areas that are ponded

Similar inclusions:
- Soils that have a thinner surface layer
- The poorly drained Cisne soils, which have more clay in the subsoil than the Newberry soil and are on landscapes similar to those of the Newberry soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some

areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table is a limitation. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. Enlarging the absorption area improves the absorption of liquid waste. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

453B2—Muren silt loam, 2 to 5 percent slopes, eroded

Composition

Muren and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Shape of areas: Irregular
Size of areas: 5 to 120 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 2 to 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—brown, friable silt loam

Subsoil:
5 to 46 inches—dark yellowish brown, brown, and yellowish brown, mottled, friable silty clay loam and silt loam
46 to 60 inches—brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Iva soils in slight depressions

Similar inclusions:
- Soils that have a thinner surface soil because of severe erosion

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Wetness delays planting in some years, and some areas may be seepy. Subsurface drains and waterways reduce the wetness. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and

erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Moderately suited to dwellings without basements
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
Subsurface seepage systems do not function properly because of the seasonal high water table. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 5A

454—Iva silt loam

Composition

Iva and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 240 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loess
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 11 inches—dark grayish brown, friable silt loam

Subsurface layer:
11 to 17 inches—brown, mottled, friable silt loam

Subsoil:
17 to 40 inches—brown, mottled, firm silty clay loam
40 to 49 inches—grayish brown, mottled, firm silt loam

Substratum:
49 to 60 inches—grayish brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of the moderately well drained Muren soils on slight rises

Similar inclusions:
- Soils that have a darker surface layer
- Small areas of soils that have more clay in the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion.

Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the seasonal high water table. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4W

533—Urban land

Composition

Urban land: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Shape of areas: Square or rectangular
Size of areas: 5 to 50 acres
Major use: Urban development, mainly on sites for parking lots, shopping centers, industrial plants, and other commercial buildings

Contrasting Inclusions

- Small areas of the poorly drained Drummer soils in depressions
- Small areas of silty Orthents that have been disturbed by urban development

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: None assigned

583B2—Pike silt loam, 2 to 5 percent slopes, eroded

Composition

Pike and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Moraines
Landform position: Summits
Shape of areas: Rounded or oblong
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess and outwash
Runoff: Slow
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—dark brown, friable silt loam

Subsoil:
9 to 37 inches—dark yellowish brown and brown, firm silty clay loam
37 to 60 inches—brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Areas that are severely eroded
- Moderately well drained soils

Similar inclusions:
- Soils that have a darker surface layer

• Areas that are more sloping

Use and Management

Cropland

Suitability: Well suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Orchardgrass, smooth bromegrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for dwellings. Some land shaping improves surface drainage. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for septic tank absorption fields. Subsurface seepage systems function well in this soil.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 5A

583C2—Pike silt loam, 5 to 10 percent slopes, eroded

Composition

Pike and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Moraines (fig. 7)
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess and a paleosol that formed in outwash
Runoff: Medium
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—dark brown, friable silt loam

Subsoil:
9 to 37 inches—dark yellowish brown and brown, firm silty clay loam
37 to 60 inches—brown, firm silt loam

Inclusions

Contrasting inclusions:
• Small areas that are severely eroded
• Moderately well drained soils
• Soils that have sodium in the subsoil

Similar inclusions:
• Soils that have a dark surface soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that

Figure 7.—Pike silt loam, 5 to 10 percent slopes, eroded (background), on one of several moraines in the county.

leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Orchardgrass, smooth bromegrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for dwellings. Some land shaping improves surface drainage. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 5A

583C3—Pike silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

Pike and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Moraines
Landform position: Side slopes
Shape of areas: Long and narrow
Size of areas: 5 to 70 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess and outwash
Runoff: Moderate
Available water capacity: High
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silty clay loam

Subsoil:
6 to 50 inches—dark yellowish brown and brown, firm silt loam and silty clay loam
50 to 72 inches—brown, firm silt loam

Inclusions

Contrasting inclusions:
- Moderately well drained soils
- Soils that have a high content of sodium in the subsoil

Similar inclusions:
- Soils that have more clay in the subsoil
- Moderately eroded soils on landscapes similar to those of the Pike soil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Orchardgrass, smooth bromegrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for dwellings. Some land shaping improves surface drainage. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Well suited
Management considerations:
Few limitations affect the use of this soil as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: IVe
Woodland ordination symbol: 5A

801—Orthents, silty, undulating

Composition

Orthents and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands

Landform: Till plains
Landform position: Upland areas that have been modified by construction, cut and fill areas, and rock quarries
Shape of areas: Rectangular
Size of areas: 10 to 360 acres
Major use: Industrial development, recreational development, or wildlife habitat

Soil Properties and Qualities

Drainage class: Somewhat poorly drained or moderately well drained
Permeability: Moderately slow or moderate
Parent material: Silty or loamy material derived from other soils
Runoff: Slow to rapid
Available water capacity: Moderate or high
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: Moderate or high

Typical Profile

Surface layer:
0 to 4 inches—olive brown, friable silty clay loam

Substratum:
4 to 60 inches—mixed dark yellowish brown, olive brown, and yellowish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Bedrock ledges
- Soils that have sandy or clayey layers

Similar inclusions:
- Areas of undisturbed soils adjacent to abandoned rock quarries
- Poorly drained soils in depressions

Use and Management

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. It is a hazard on short slopes and in depressions. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Wildlife habitat

Suitability: Well suited to openland wildlife habitat
Management considerations:
These soils are suitable for grain and seed crops and for grasses and legumes, such as bromegrass, orchardgrass, and ladino, alsike, and red clover, which are necessary elements of openland wildlife habitat. Protection from grazing is essential. Shallow depressions provide nesting areas for certain types of waterfowl.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: None assigned

912A—Hoyleton-Darmstadt complex, 0 to 2 percent slopes

Composition

Hoyleton and similar soils: 40 to 60 percent
Darmstadt and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Hoyleton

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Darmstadt

Drainage class: Somewhat poorly drained

Permeability: Very slow
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Hoyleton

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 15 inches—brown, friable silt loam

Subsoil:
15 to 26 inches—brown, mottled, friable silty clay loam
26 to 36 inches—grayish brown, mottled, firm silty clay loam
36 to 45 inches—light gray, mottled, firm silty clay loam

Substratum:
45 to 56 inches—light brownish gray, mottled, firm silty clay loam
56 to 60 inches—light gray, mottled, firm silty clay loam

Darmstadt

Surface layer:
0 to 9 inches—dark grayish brown, friable silt loam

Subsurface layer:
9 to 14 inches—light brownish gray, mottled, friable silt loam

Subsoil:
14 to 20 inches—light olive brown, mottled, firm silty clay loam
20 to 40 inches—light brownish gray, mottled, firm silty clay loam
40 to 52 inches—grayish brown, mottled, firm clay loam

Substratum:
52 to 60 inches—light brownish gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
• The poorly drained Cisne soils in slight depressions
• Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Hoyleton and Darmstadt soils

Similar inclusions:
• Soils that have a light colored surface layer and do not have sodium in the subsoil
• Soils that have a light colored surface layer and have a high content of clay and sodium in the subsoil

Use and Management

Cropland

Suitability: Hoyleton—well suited; Darmstadt—moderately suited
Management considerations:
These soils are sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soils are wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soils dry. A high content of sodium in the subsoil of the Darmstadt soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The seasonal high water table in both soils and the high content of sodium in the Darmstadt soil limit the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited

Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: Hoyleton—IIw; Darmstadt—IIIw
Woodland ordination symbol: Hoyleton—4A; Darmstadt—4T

912B2—Hoyleton-Darmstadt complex, 2 to 5 percent slopes, eroded

Composition

Hoyleton and similar soils: 40 to 60 percent
Darmstadt and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Hoyleton

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy sediments over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: High

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and silty or loamy sediments over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Hoyleton

Surface layer:
0 to 7 inches—dark brown, friable silt loam

Subsoil:
7 to 12 inches—yellowish brown, friable silt loam
12 to 18 inches—yellowish brown, mottled, firm silty clay loam
18 to 32 inches—light brownish gray, mottled, firm silty clay loam
32 to 50 inches—light gray, mottled, firm clay loam

Substratum:
50 to 60 inches—light gray, mottled, firm clay loam

Darmstadt

Surface layer:
0 to 6 inches—dark brown, friable silt loam

Subsoil:
6 to 14 inches—yellowish brown, mottled, friable silty clay loam
14 to 33 inches—grayish brown, mottled, firm silty clay loam

Substratum:
33 to 44 inches—light brownish gray, mottled, firm silty clay loam
44 to 60 inches—light brownish gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
• Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Hoyleton and Darmstadt soils

• Poorly drained soils in slight depressions

Similar inclusions:
• Areas that are severely eroded
• Soils that have a light colored surface layer and do not have sodium
• Soils that have a light colored surface layer, a high content of clay, and sodium in the subsoil

Use and Management

Cropland

Suitability: Hoyleton—well suited; Darmstadt—moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soils are wet causes surface cloddiness and compaction and excessive runoff and erosion. A high content of sodium in the subsoil of the Darmstadt soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. The species that are tolerant of wetness and a high level of sodium should be selected for planting. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: Hoyleton—IIe; Darmstadt—IIIe
Woodland ordination symbol: Hoyleton—4A; Darmstadt—4T

916A—Oconee-Darmstadt complex, 0 to 2 percent slopes

Composition

Oconee and similar soils: 40 to 60 percent
Darmstadt and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight

Shrink-swell potential: High
Potential for frost action: High

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Oconee

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 20 inches—dark grayish brown and grayish brown, friable silt loam

Subsoil:
20 to 41 inches—brown, mottled, firm silty clay loam
41 to 55 inches—grayish brown, mottled, firm silty clay loam

Substratum:
55 to 60 inches—light gray, mottled, firm silt loam

Darmstadt

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 11 inches—grayish brown, mottled, friable silt loam

Subsoil:
11 to 17 inches—brown, mottled, firm silty clay loam
17 to 53 inches—grayish brown, mottled, firm silty clay loam

Substratum:
53 to 60 inches—light brownish gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Oconee and Darmstadt soils
- Poorly drained soils in slight depressions

Similar inclusions:
- Soils that have a light colored surface layer and do not have sodium in the subsoil
- Soils that have a light colored surface layer and have a high content of clay and sodium in the subsoil

Use and Management

Cropland

Suitability: Oconee—well suited; Darmstadt—moderately suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soils are wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. A high content of sodium in the subsoil of the Darmstadt soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness and high levels of sodium should be selected for planting. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited

Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of restricted permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: Oconee—IIw; Darmstadt—IIIw
Woodland ordination symbol: Oconee—none assigned; Darmstadt—4T

916B2—Oconee-Darmstadt complex, 2 to 5 percent slopes, eroded

Composition

Oconee and similar soils: 40 to 60 percent
Darmstadt and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Moderate
Shrink-swell potential: High
Potential for frost action: High

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Oconee

Surface layer:
0 to 7 inches—very dark gray, mottled, friable silt loam

Subsurface layer:
7 to 10 inches—grayish brown, mottled, friable silt loam

Subsoil:
10 to 16 inches—brown, mottled, friable silty clay loam
16 to 40 inches—brown, mottled, firm silty clay loam
40 to 51 inches—grayish brown, mottled, firm silty clay loam

Substratum:
51 to 60 inches—dark brown, mottled, firm silty clay loam

Darmstadt

Surface layer:
0 to 6 inches—very dark grayish brown, mottled, friable silt loam

Subsoil:
6 to 22 inches—brown, mottled, firm silty clay loam
22 to 35 inches—grayish brown, mottled, firm silty clay loam
35 to 42 inches—grayish brown, mottled, firm silt loam

Substratum:
42 to 60 inches—light brownish gray, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Oconee and Darmstadt soils

- Poorly drained soils in slight depressions

Similar inclusions:
- Areas that are severely eroded
- Soils that have a light colored surface layer and do not have sodium
- Soils that have a light colored surface layer and a high content of clay and sodium in the subsoil

Use and Management

Cropland

Suitability: Oconee—well suited; Darmstadt—moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soils are wet causes surface cloddiness and compaction and excessive runoff and erosion. A high content of sodium in the subsoil of the Darmstadt soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness and high levels of sodium should be selected for planting. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: Oconee—IIe; Darmstadt—IIIe
Woodland ordination symbol: Oconee—none assigned; Darmstadt—4T

934B2—Blair-Grantfork complex, 2 to 5 percent slopes, eroded

Composition

Blair and similar soils: 40 to 60 percent
Grantfork and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Blair

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty water-worked sediments and glacial till
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate

Shrink-swell potential: Moderate
Potential for frost action: High

Grantfork

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and glacial till
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Blair

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Subsoil:
7 to 13 inches—yellowish brown, mottled, firm silt loam
13 to 24 inches—brown, mottled, firm silty clay loam
24 to 46 inches—grayish brown, mottled, firm silty clay loam
46 to 60 inches—grayish brown, mottled, firm clay loam

Grantfork

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsoil:
5 to 11 inches—brown, mottled, friable silty clay loam
11 to 18 inches—gray, mottled, firm silty clay loam
18 to 60 inches—gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
- Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Blair and Grantfork soils
- Small areas that are more sloping

Similar inclusions:
- Areas that are severely eroded
- Soils that have a clayey subsoil
- Soils that have a sandy subsoil

Use and Management

Cropland

Suitability: Blair—well suited; Grantfork—moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soils are wet causes surface cloddiness and compaction and excessive runoff and erosion. A high content of sodium in the subsoil of the Grantfork soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness and high levels of sodium should be selected for planting. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function

properly because of the restricted permeability and the seasonal high water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: Blair—IIe; Grantfork—IIIe
Woodland ordination symbol: Blair—4A; Grantfork—4T

934C2—Blair-Grantfork complex, 5 to 10 percent slopes, eroded

Composition

Blair and similar soils: 40 to 60 percent
Grantfork and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Blair

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty water-worked sediments and glacial till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Grantfork

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Blair

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsoil:
8 to 15 inches—dark yellowish brown, mottled, firm silt loam
15 to 19 inches—dark yellowish brown, mottled, firm silty clay loam
19 to 28 inches—yellowish brown, mottled, firm silty clay loam
28 to 50 inches—gray, mottled, firm silty clay loam

Substratum:
50 to 60 inches—gray, mottled, firm loam

Grantfork

Surface layer:
0 to 4 inches—dark grayish brown, friable silt loam

Subsoil:
4 to 11 inches—brown, mottled, friable silty clay loam
11 to 22 inches—grayish brown, mottled, firm clay loam
22 to 42 inches—gray, mottled, firm clay loam
42 to 60 inches—dark gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
- Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Blair and Grantfork soils
- Small areas that are more sloping

Similar inclusions:
- Areas that are severely eroded
- Soils that have a high content of clay in the subsoil
- Soils that have a high content of sand in the subsoil

Use and Management

Cropland

Suitability: Blair—moderately suited; Grantfork—poorly suited
Management considerations:
Unless the surface is protected, further erosion is a severe hazard in areas used for corn, soybeans, or small grain. It can be controlled by contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that is dominated by forage crops. Tilling when the soils are wet causes surface cloddiness and compaction and excessive runoff and erosion. A high

content of sodium in the subsoil of the Grantfork soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness and high levels of sodium should be selected for planting. Overgrazing or grazing when the soils are too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. The seasonal high water table can be lowered by installing tile drains around the base of foundations. Reinforcing foundations, widening the foundation trench, and backfilling the trench with suitable coarse material minimize the structural damage caused by shrinking and swelling. The hazard of erosion during construction can be reduced by leaving as much vegetation on the surface as possible. Disturbed areas should be seeded or sodded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. A buried sand filter, an NSF Class I aeration unit, or a recirculating sand filter is a suitable alternative.

Interpretive Groups

Land capability classification: Blair—IIIe; Grantfork—IVe
Woodland ordination symbol: Blair—4A; Grantfork—4T

941—Virden-Piasa complex

Composition

Virden and similar soils: 70 to 80 percent
Piasa and similar soils: 10 to 20 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Virden

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Piasa

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Virden

Surface layer:
0 to 13 inches—very dark grayish brown, friable silt loam

Subsurface layer:
13 to 18 inches—very dark grayish brown, mottled, friable silt loam

Subsoil:
18 to 46 inches—dark grayish brown, mottled, firm silty clay loam
46 to 60 inches—gray, mottled, firm silty clay loam

Piasa

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 14 inches—dark gray, friable silt loam

Subsoil:
14 to 41 inches—dark grayish brown, mottled, firm silty clay loam
41 to 49 inches—grayish brown, mottled, firm silty clay loam
49 to 60 inches—dark grayish brown, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Virden and Piasa soils
- Somewhat poorly drained soils on slight rises

Similar inclusions:
- Soils that have less sodium
- Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Virden—well suited; Piasa—moderately suited
Management considerations:
These soils are sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soils are wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soils dry. A high content of sodium in the subsoil of the Piasa soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The seasonal high water table and high levels of sodium limit the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. A combination of surface ditches and land leveling helps to control ponding. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability, the seasonal high water table, and ponding. A combination of surface ditches and land leveling helps to control ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: Virden—IIw; Piasa—IIIw
Woodland ordination symbol: None assigned

991—Cisne-Huey complex

Composition

Cisne and similar soils: 60 to 70 percent
Huey and similar soils: 20 to 30 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 600 acres
Major use: Cropland (fig. 8)

Soil Properties and Qualities

Cisne

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and loamy sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Huey

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and erosional sediments over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Cisne

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 15 inches—grayish brown, mottled, friable silt loam

Subsoil:
15 to 41 inches—grayish brown, mottled, firm silty clay loam
41 to 51 inches—gray, mottled, firm silty clay loam

Substratum:
51 to 58 inches—dark gray, mottled, firm loam
58 to 60 inches—gray, mottled, firm silty clay loam

Huey

Surface layer:
0 to 7 inches—dark grayish brown, very friable silt loam

Subsurface layer:
7 to 12 inches—grayish brown, mottled, very friable silt loam

Subsoil:
12 to 15 inches—dark grayish brown, mottled, firm silty clay loam
15 to 51 inches—light gray, mottled, firm silty clay loam

Substratum:
51 to 60 inches—gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• Somewhat poorly drained soils on slight rises
• Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Cisne and Huey soils

Similar inclusions:
• Poorly drained soils that have a light colored surface layer and do not have sodium in the subsoil
• Poorly drained soils that have a dark surface layer and have sodium in the subsoil

Use and Management

Cropland

Suitability: Cisne—moderately suited; Huey—poorly suited
Management considerations:
These soils are sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soils are wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soils dry. A high content of sodium in the subsoil of the Huey soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the

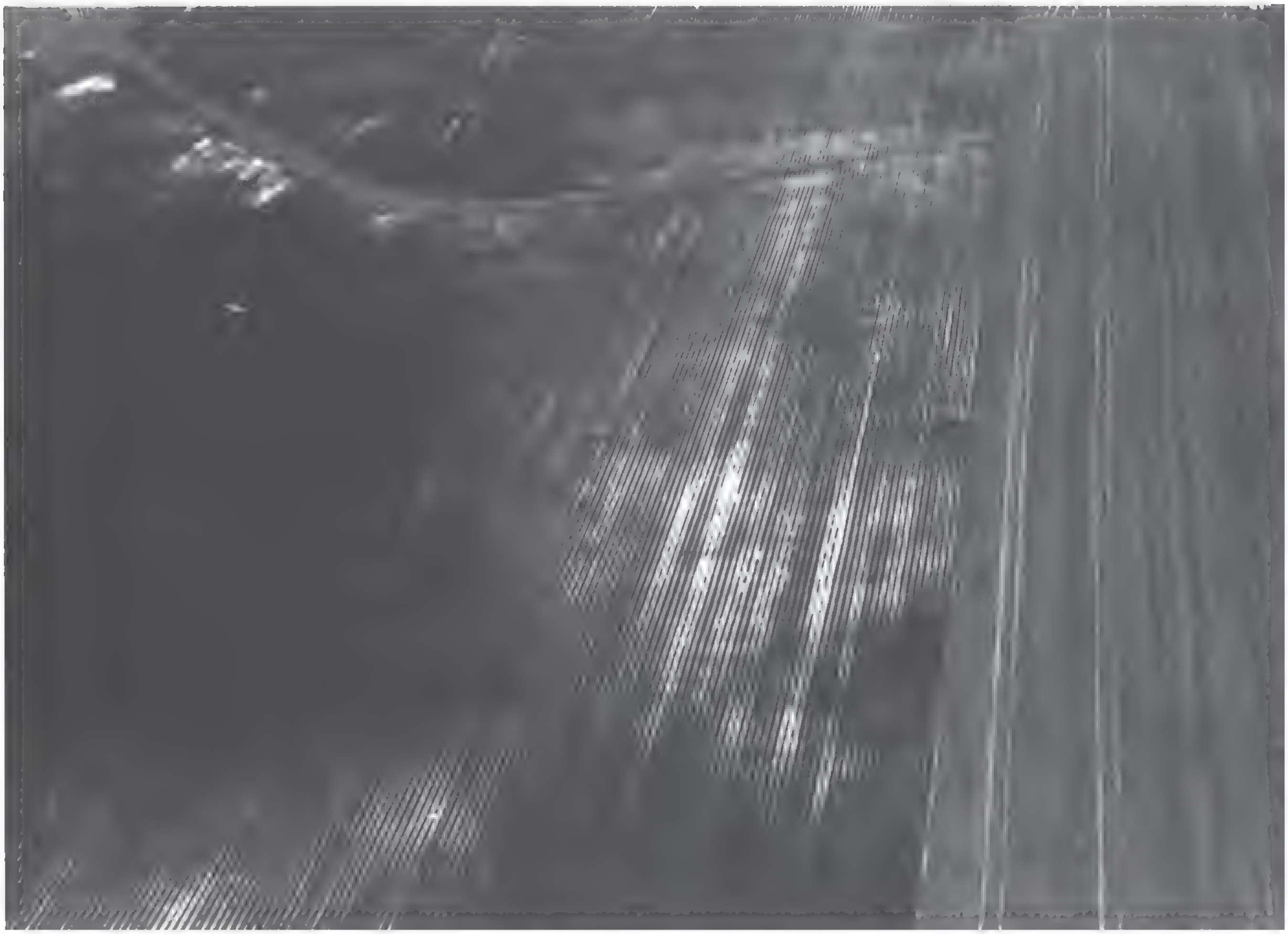

Figure 8.—Cropland in an area of the Cisne-Huey complex. The Cisne soil is in the dark colored areas, and the Huey soil is in the light colored areas.

subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The seasonal high water table and high levels of sodium limit the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. A combination of surface ditches and land leveling helps to control ponding.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function

properly because of the very slow permeability, the seasonal high water table, and the ponding. A combination of surface ditches and land leveling helps to control ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: Cisne—IIIw; Huey—IVw
Woodland ordination symbol: Cisne—4W; Huey—3T

993—Cowden-Piasa complex

Composition

Cowden and similar soils: 40 to 60 percent
Piasa and similar soils: 30 to 50 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Cowden

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Piasa

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Cowden

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 15 inches—gray, mottled, friable silt loam

Subsoil:
15 to 20 inches—dark grayish brown, mottled, firm silty clay loam
20 to 50 inches—grayish brown, mottled, firm silty clay loam

Substratum:
50 to 60 inches—light brownish gray, mottled, firm silty clay loam

Piasa

Surface layer:
0 to 7 inches—very dark gray, friable silt loam

Subsurface layer:
7 to 10 inches—gray, mottled, friable silt loam

Subsoil:
10 to 25 inches—dark grayish brown, mottled, firm silty clay loam
25 to 50 inches—grayish brown, mottled, firm silty clay loam

Substratum:
50 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• Somewhat poorly drained soils on slight rises
• Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Cowden and Piasa soils

Similar inclusions:
• Soils that have a dark surface layer and have less sodium than the Piasa soil
• Poorly drained soils that have a light colored surface layer and do not have sodium in the subsoil

Use and Management

Cropland

Suitability: Cowden—well suited; Piasa—moderately suited
Management considerations:
These soils are sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the

drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soils are wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soils dry. A high content of sodium in the subsoil of the Piasa soil restricts the availability of water and interferes with the uptake of plant nutrients. During dry periods crops commonly show signs of stress because of the sodium. The high content of sodium has a greater effect on corn yields than on yields of soybeans, grain sorghum, and wheat. During the construction of terraces and grassed waterways, special care must be taken so as not to leave the subsoil exposed. Revegetation of the exposed subsoil is extremely difficult. Returning crop residue to the soils, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The seasonal high water table and high levels of sodium limit the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. A combination of surface ditches and land leveling helps to control ponding.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability, the seasonal high water table, and the ponding. A combination of surface ditches and land leveling helps to control ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: Cowden—IIw; Piasa—IIIw
Woodland ordination symbol: None assigned

2002—Cisne-Urban land complex

Composition

Cisne and similar soils: 40 to 60 percent
Urban land: 30 to 50
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Rectangular
Size of areas: 10 to 90 acres
Major use: Residential or commercial development

Soil Properties and Qualities

Cisne

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and loamy sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Cisne

Surface layer:
0 to 9 inches—dark grayish brown, friable silt loam

Subsurface layer:
9 to 17 inches—grayish brown, mottled, friable silt loam

Subsoil:
17 to 20 inches—light brownish gray, mottled, firm silt loam
20 to 26 inches—grayish brown, mottled, firm silty clay
26 to 53 inches—light brownish gray, mottled, firm silty clay loam

53 to 60 inches—light gray, mottled, firm silty clay loam

Characteristics of Urban Land

The urban areas are covered by streets, parking lots, buildings, and other structures. The soils in these areas are so disturbed that they cannot be identified.

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Hoyleton soils on slight rises
- Some areas that are ponded after rainfall

Similar inclusions:
- Soils that have a lighter colored surface layer
- The poorly drained Newberry soils, which have less clay in the subsoil than the Cisne soil and are on landscapes similar to those of the Cisne soil

Use and Management

Dwellings

Suitability: Cisne—poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Cisne—poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: Cisne—4W; Urban land—none assigned

2912A—Hoyleton-Darmstadt-Urban land complex, 0 to 2 percent slopes

Composition

Darmstadt and similar soils: 25 to 35 percent
Hoyleton and similar soils: 25 to 35 percent
Urban land: 25 to 35 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landscape: Uplands
Landform: Till plains
Landform position: Summits
Shape of areas: Irregular
Size of areas: 20 to 100 acres
Major use: Residential or commercial development

Soil Properties and Qualities

Hoyleton

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and silty or loamy sediments over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and silty or loamy sediments over a paleosol that formed in glacial till
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Hoyleton

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:
7 to 16 inches—dark grayish brown and brown, friable silt loam

Subsoil:
16 to 42 inches—yellowish brown, brown, and pale brown, mottled, firm silty clay and silty clay loam

Substratum:
42 to 60 inches—grayish brown and light brownish gray, mottled, firm silty clay loam

Darmstadt

Surface layer:
0 to 12 inches—very dark grayish brown and dark grayish brown, friable silt loam

Subsurface layer:
12 to 16 inches—grayish brown, mottled, firm silt loam

Subsoil:
16 to 40 inches—brown and grayish brown, mottled, firm silty clay
40 to 57 inches—grayish brown and gray, mottled, firm silt loam and silty clay loam

Substratum:
57 to 60 inches—grayish brown, mottled, firm silty clay loam

Characteristics of Urban Land

The urban areas are covered by streets, parking lots, buildings, and other structures. The soils in these areas are so disturbed that they cannot be identified.

Inclusions

Contrasting inclusions:
• Small areas of soils that have sodium at the surface and are on landscapes similar to those of the Hoyleton and Darmstadt soils

Similar inclusions:
• The poorly drained Cisne soils in slight depressions
• Soils that have a light colored surface layer and do not have sodium in the subsoil
• Soils that have a light colored surface layer and have a high content of clay and sodium in the subsoil

Use and Management

Dwellings

Suitability: Hoyleton and Darmstadt—poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness.

Septic tank absorption fields

Suitability: Hoyleton and Darmstadt—poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the restricted permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative.

Interpretive Groups

Land capability classification: None assigned
Woodland ordination symbol: Hoyleton—4A; Darmstadt—4T; Urban land—none assigned

3070—Beaucoup silt loam, frequently flooded

Composition

Beaucoup and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 400 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty slackwater sediments
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface soil:
0 to 14 inches—very dark gray and very dark grayish brown, friable silt loam and silty clay loam

Subsoil:
14 to 60 inches—dark gray and gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Wakeland soils on slight rises
• Low areas that are wet most of the year

Similar inclusions:
• Soils that have less organic matter in the surface layer
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Woodland

Suitability: Poorly suited
Management considerations:
An equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns because of wetness. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that are tolerant of excessive moisture. The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. The undesirable vegetation in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Measures that protect the woodland from fire are needed.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 5W

3083—Wabash silty clay, frequently flooded

Composition

Wabash and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 210 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Alluvium
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—black, friable silty clay

Subsurface layer:
10 to 54 inches—very dark gray, firm silty clay

Subsoil:
54 to 60 inches—dark gray, firm silty clay

Inclusions

Contrasting inclusions:
- Low areas that are wet most of the year
- Soils that have less clay in the subsoil than the Wabash soil

Similar inclusions:
- Soils that have less organic matter in the surface layer
- Somewhat poorly drained soils on slight rises

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: None assigned

3131A—Alvin silt loam, 0 to 2 percent slopes, frequently flooded

Composition

Alvin and similar soils: 35 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part of the soil and moderately rapid in the lower part
Parent material: Loamy and sandy material deposited by wind or water
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Subsoil:
7 to 50 inches—yellowish brown and dark yellowish brown, firm loam

Substratum:
50 to 60 inches—dark yellowish brown, firm sandy loam

Inclusions

Contrasting inclusions:
- Small areas of the poorly drained Beaucoup and Birds soils at the lower elevations
- Small areas of the somewhat poorly drained Wakeland soils at elevations similar to those of the Alvin soil

Similar inclusions:
- Small areas of soils that have sand at the surface
- Small areas of soils that have a silty subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
If this soil is used for corn or soybeans, flooding delays planting in some years. It occurs during late

winter or early spring. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons also reduces the extent of this damage. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Climatically adapted forage and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIs
Woodland ordination symbol: 4A

3288—Petrolia silty clay loam, frequently flooded

Composition

Petrolia and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 600 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 3.0 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown, very friable silty clay loam

Substratum:
6 to 60 inches—dark gray, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Wakeland soils on slight rises
- Low areas that are wet most of the year

Similar inclusions:
- Soils that have less clay in the subsoil
- Soils that have more organic matter in the surface layer

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Woodland

Suitability: Moderately suited
Management considerations:
An equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns because of wetness. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that are tolerant of excessive moisture. The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. The undesirable vegetation in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Measures that protect the woodland from fire are needed.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 5W

3304A—Landes fine sandy loam, 0 to 2 percent slopes, frequently flooded

Composition

Landes and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderately rapid in the upper part of the soil and rapid in the lower part
Parent material: Loamy and sandy alluvium
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Moderately low
Hazard of erosion: Slight
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown, friable fine sandy loam

Subsoil:
12 to 20 inches—dark brown, very friable fine sandy loam
20 to 39 inches—dark brown and very dark yellowish brown, friable loamy fine sand

Substratum:
39 to 60 inches—brown, mottled, friable loamy fine sand

Inclusions

Contrasting inclusions:
- The poorly drained Beaucoup, Birds, and Petrolia soils in depressions
- Soils that have less sand in the subsoil than the Landes soil

Similar inclusions:
- Soils that have less organic matter in the surface soil
- Somewhat poorly drained soils on landscapes similar to those of the Landes soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
If this soil is used corn or soybeans, flooding delays planting in some years. It occurs during late winter or early spring. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons also reduces the extent of this damage. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover

Management considerations:
Climatically adapted forage and hay plants grow well on this soil. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 7A

3333—Wakeland silt loam, frequently flooded

Composition

Wakeland and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Size of areas: 5 to 400 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, mottled, friable silt loam

Substratum:
7 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- The poorly drained Birds soils in depressions
- Soils that have more sand than the Wakeland soil

Similar inclusions:
- Soils that have more organic matter in the surface layer
- Soils that are better drained than the Wakeland soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
If this soil is used corn or soybeans, flooding delays planting in some years. It occurs during late winter or early spring. Dikes or diversions reduce the extent of the crop damage caused by floodwater. Selecting crop varieties adapted to shorter growing seasons and wetter soil conditions also reduces the extent of this damage. Wetness can be reduced by surface ditches or subsurface drains. Keeping tillage to a minimum and returning crop residue to the soil help to maintain tilth and productivity.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Subsurface tile drains can help to lower the seasonal high water table if suitable outlets are available. Overgrazing or grazing when the soil is too wet reduces forage yields, causes surface compaction and excessive runoff, and increases the susceptibility to erosion. Rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 5A

3334—Birds silt loam, frequently flooded

Composition

Birds and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 600 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, mottled, friable silt loam

Substratum:
7 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- Small areas of the somewhat poorly drained Wakeland soils on slight rises
- Some low areas that are wet most of the year

Similar inclusions:
- Soils that have more organic matter in the surface layer
- Soils that have more clay

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Woodland

Suitability: Poorly suited
Management considerations:
An equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns because of wetness. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that are tolerant of excessive moisture. The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. The undesirable vegetation in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Measures that protect the woodland from fire are needed.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 5W

3402—Colo silt loam, frequently flooded

Composition

Colo and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Alluvium
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 18 inches—very dark grayish brown, friable silt loam

Subsurface layer:
18 to 53 inches—very dark gray, mottled, firm silty clay loam

Subsoil:
53 to 60 inches—very dark gray, firm silty clay loam

Inclusions

Contrasting inclusions:
- Low areas that are wet most of the year
- Soils that have more clay in the subsoil than the Colo soil
- Small areas that are ponded after rainfall

Similar inclusions:
- Somewhat poorly drained soils on slight rises
- Soils that have less organic matter in the surface layer

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: None assigned

3603—Blackoar silt loam, frequently flooded

Composition

Blackoar and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Flood plains

Landform: High flood plains
Landform position: Bottoms
Shape of areas: Irregular
Frequency of flooding: Frequent
Duration of flooding: Brief
Size of areas: 5 to 600 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderate
Parent material: Alluvium
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: Within a depth of 1 foot
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface soil:
0 to 18 inches—very dark grayish brown, mottled, friable silt loam

Subsoil:
18 to 44 inches—dark gray, gray, and light gray, mottled, firm silt loam

Substratum:
44 to 60 inches—light brownish gray, mottled, firm silt loam

Inclusions

Contrasting inclusions:
- Low areas that are wet most of the year
- Somewhat poorly drained soils on slight rises
- Some areas that are ponded after rainfall

Similar inclusions:
- Soils that have more clay in the subsoil
- Soils that have less organic matter in the surface layer

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Woodland

Suitability: Poorly suited
Management considerations:
An equipment limitation, seedling mortality, the windthrow hazard, and plant competition are management concerns because of wetness. Machinery should be used only when the soil is firm enough to support the equipment. The seedling mortality rate can be reduced by planting species that are tolerant of excessive moisture. The windthrow hazard can be reduced by harvesting methods that do not isolate the remaining trees or leave them widely spaced. The undesirable vegetation in openings where timber has been harvested can be controlled by chemical or mechanical means. Excluding livestock from the woodland helps to prevent destruction of the leaf mulch, compaction of the soil, and damage to tree roots and to desirable young trees. Measures that protect the woodland from fire are needed.

Wildlife habitat

Suitability: Moderately suited to woodland wildlife habitat
Management considerations:
The wooded areas of this soil provide fair habitat for woodland wildlife. Measures that exclude livestock from these areas help to prevent depletion of the shrubs and sprouts that provide food and cover for woodland wildlife, such as deer, squirrels, and a variety of songbirds. Hedges and rows of shrubs provide cover for doves and many songbirds.

Dwellings

Suitability: Generally unsuited because of frequent flooding

Septic tank absorption fields

Suitability: Generally unsuited because of frequent flooding

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4W

7026—Wagner silt loam, rarely flooded

Composition

Wagner and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Lacustrine sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: Within a depth of 2 feet
Content of organic matter: Moderate
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 19 inches—grayish brown, mottled, firm silt loam

Subsoil:
19 to 41 inches—grayish brown, mottled, firm silty clay loam

Substratum:
41 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Bartelso soils on slight rises
- The poorly drained Lakaskia soils in depressions
- Small areas that are ponded after rainfall

Similar inclusions:
- Soils that have less organic matter in the surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Flooding is a hazard during the growing season. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization

pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4W

7084—Okaw silt loam, rarely flooded

Composition

Okaw and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Rare
Ponding: Occurring in some areas after rainfall
Size of areas: 5 to 120 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Clayey lacustrine sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 15 inches—grayish brown, mottled, firm silt loam

Subsoil:
15 to 60 inches—grayish brown, mottled, firm silty clay loam and silty clay

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Hurst soils on slight rises

Similar inclusions:
• The poorly drained Lakaskia soils in depressions
• Soils that have more organic matter in the surface layer
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table, the shrink-swell potential, and the ponding are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness and help to control ponding. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability, the

seasonal high water table, and the ponding. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4W

7338A—Hurst silt loam, 0 to 2 percent slopes, rarely flooded

Composition

Hurst and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and lacustrine sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—grayish brown, mottled, friable silt loam

Subsoil:
12 to 60 inches—brown and grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The poorly drained Okaw soils in depressions

Similar inclusions:
- The somewhat poorly drained Bartelso soils on landscapes similar to those of the Hurst soil
- Soils that have less clay in the subsoil
- Soils that have more organic matter in the surface layer

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function

properly because of the very slow permeability and the seasonal high water table. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: 4C

7338B—Hurst silt loam, 2 to 5 percent slopes, eroded, rarely flooded

Composition

Hurst and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Terrace divides
Shape of areas: Long and narrow
Frequency of flooding: Rare
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and lacustrine sediments
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Subsoil:
7 to 54 inches—brown, grayish brown, and light brownish gray, mottled, firm silty clay loam

Substratum:
54 to 60 inches—light brownish gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Moderately well drained soils on landscapes similar to those of the Hurst soil
- Small areas of more sloping soils

Similar inclusions:
- Soils that have less clay in the subsoil
- Areas that are severely eroded

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
Measures that control erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, terraces, and a crop rotation that includes 1 or more years of forage crops. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain tilth.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited

Management considerations:
Subsurface seepage systems do not function properly because of the very slow permeability and the seasonal high water table. Installing underground drains lowers the water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIIe
Woodland ordination symbol: 4C

7434B—Ridgway silt loam, 2 to 5 percent slopes, eroded, rarely flooded

Composition

Ridgway and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and terrace divides
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to more than 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part of the soil and rapid in the lower part
Parent material: Loess and loamy and sandy outwash
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: Low
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—brown, friable silt loam

Subsoil:
8 to 16 inches—dark yellowish brown, firm silty clay loam
16 to 27 inches—brown, firm silty clay loam
27 to 32 inches—brown, firm clay loam
32 to 52 inches—brown, firm sandy loam

Substratum:
52 to 60 inches—brown, loose loamy sand

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Geff and poorly drained Racoon soils on the slightly lower parts of the landscape

Similar inclusions:
- Soils that have more sand in the upper part
- Moderately well drained soils
- Soils that are more sloping or less sloping

Use and Management

Cropland

Suitability:
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
Subsurface seepage systems function well in this soil. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: 7A

7436B—Meadowbank silt loam, 2 to 5 percent slopes, rarely flooded

Composition

Meadowbank and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and terrace divides
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to more than 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate in the upper part of the soil and rapid in the lower part
Parent material: Loess and loamy or sandy outwash
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: More than 6 feet below the surface
Content of organic matter: High
Hazard of erosion: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 13 inches—very dark gray, friable silt loam

Subsurface layer:
13 to 17 inches—dark brown, friable silt loam

Subsoil:
17 to 34 inches—brown, friable silty clay loam
34 to 45 inches—brown, friable loam
45 to 53 inches—brown, friable sandy loam

Substratum:
53 to 60 inches—brown, loose loamy sand

Inclusions

Contrasting inclusions:
- Moderately well drained soils on landscapes similar to those of the Meadowbank soil
- Small areas of soils that are more sloping than the Meadowbank soil

Similar inclusions:
- Soils that have more sand in the upper part
- Soils that are more sloping or less sloping

Use and Management

Cropland

Suitability:
Management considerations:
Measures that help to control further erosion are needed in areas used for corn, soybeans, or small grain. Examples are contour farming, a system of conservation tillage that leaves crop residue on the surface after planting, and terraces. Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Suitable species: Bromegrass, orchardgrass, tall fescue, timothy, alfalfa, red clover, and ladino clover
Management considerations:
Erosion is a hazard, particularly during the establishment period. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields:

Suitability: Moderately suited
Management considerations:
Subsurface seepage systems work well in this soil. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIe
Woodland ordination symbol: None assigned

7466—Bartelso silt loam, rarely flooded

Composition

Bartelso and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to more than 400 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and lacustrine sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 12 inches—very dark grayish brown, friable silt loam

Subsoil:
12 to 17 inches—brown, mottled, firm silty clay loam
17 to 35 inches—brown, mottled, firm silty clay
35 to 45 inches—gray, mottled, firm silty clay loam

Substratum:
45 to 60 inches—gray, mottled, very firm silt loam

Inclusions

Contrasting inclusions:
- The poorly drained Lakaskia soils in depressions
- Moderately well drained or well drained soils in the higher areas

Similar inclusions:
- Soils that have less clay in the subsoil
- Soils that have a thinner dark surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: None assigned

7468—Lakaskia silt loam, rarely flooded

Composition

Lakaskia and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Rare
Size of areas: 5 to more than 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess and lacustrine sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: Within a depth of 1 foot
Content of organic matter: High
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 13 inches—very dark gray, friable silt loam

Subsoil:
13 to 17 inches—dark grayish brown, mottled, firm silty clay loam
17 to 26 inches—grayish brown, mottled, firm silty clay loam
26 to 36 inches—grayish brown, mottled, firm silty clay
36 to 50 inches—grayish brown, mottled, firm silty clay loam

Substratum:
50 to 60 inches—gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- Some areas that are ponded after rainfall
- The somewhat poorly drained Bartelso and Hurst soils on slight rises
- The poorly drained Wagner and Okaw soils in depressions

Similar inclusions:
- Soils that have a thicker mantle of loess
- Soils that have more or less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
This soil is sufficiently drained for corn, soybeans, and small grain. Additional drainage is needed in some areas. Measures that maintain the drainage system are needed. A combination of surface ditches and land leveling reduces the wetness. Tilling when the soil is wet causes surface compaction and decreases the rate of water infiltration. Bare areas tend to puddle after heavy rainfall and crust when the soil dries. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth. Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Poorly suited
Management considerations:
The seasonal high water table and the shrink-swell potential are limitations. Reinforcing footings and foundations minimizes the structural damage caused by shrinking and swelling. Installing subsurface drains around the footings lowers the water table. Elevating the floor of dwellings without basements above the surrounding ground level, grading, and diverting surface water from the site reduce the wetness. Flooding is unlikely but is possible under unusual weather conditions.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
Subsurface seepage systems do not function properly because of the slow permeability and the seasonal high water table. An NSF Class I aeration unit, a recirculating sand filter, or a waste stabilization

pond is a suitable alternative. Flooding is unlikely but is possible under unusual weather conditions.

Interpretive Groups

Land capability classification: IIIw
Woodland ordination symbol: None assigned

8109—Racoon silt loam, occasionally flooded

Composition

Racoon and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and footslopes
Shape of areas: Irregular
Frequency of flooding: Occasional
Duration of flooding: Brief
Size of areas: 5 to more than 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Mixture of loess and silty local alluvium
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:
6 to 23 inches—grayish brown and light brownish gray, mottled, friable silt loam

Subsoil:
23 to 30 inches—light brownish gray, mottled, friable silty clay loam
30 to 45 inches—grayish brown, mottled, firm silty clay loam

Substratum:
45 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Geff and well drained Ridgway soils on slight rises or in the more sloping areas

Similar inclusions:
- Soils that have more clay in the subsoil
- Soils that have more sand throughout

Use and Management

Cropland

Suitability: Well suited
Management considerations:
This soil is sufficiently drained for soybeans and corn. Measures that maintain or improve the drainage system are needed. Surface ditches or subsurface drains reduce the wetness. Flooding is a hazard but occurs only occasionally during the growing season. Tilling when the soil is wet causes surface cloddiness and compaction. Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
Wetness limits the choice of plants and the period of grazing or cutting. Shallow ditching and land smoothing reduce the wetness. Applications of fertilizer, weed control, rotation grazing, proper stocking rates, and timely harvesting help to keep the pasture or hayland in good condition.

Dwellings

Suitability: Generally unsuited because of occasional flooding

Septic tank absorption fields

Suitability: Generally unsuited because of occasional flooding

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4W

8432A—Geff silt loam, 0 to 2 percent slopes, occasionally flooded

Composition

Geff and similar soils: 85 to 95 percent
Contrasting inclusions: 5 to 15 percent

Setting

Landscape: Terraces
Landform: Stream terraces
Landform position: Summits
Shape of areas: Irregular
Frequency of flooding: Occasional
Duration of flooding: Brief
Size of areas: 5 to more than 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loess and loamy outwash
Runoff: Very slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Content of organic matter: Low
Hazard of erosion: Slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown, friable silt loam

Subsurface layer:
5 to 12 inches—brown, mottled, friable silt loam

Subsoil:
12 to 20 inches—dark yellowish brown, mottled, friable silt loam
20 to 33 inches—dark yellowish brown, mottled, friable silty clay loam
33 to 50 inches—dark yellowish brown, mottled, friable silt loam

Substratum:
50 to 60 inches—dark yellowish brown, mottled, friable loam

Inclusions

Contrasting inclusions:
• The poorly drained Racoon soils on the slightly lower parts of the landscape
• The well drained Ridgway soils on the slightly higher parts of the landscape or in the more sloping areas

Similar inclusions:
• Soils that have a higher content of sand in the upper part
• Soils that have a surface layer that is darker than that of the Geff soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
In areas used for corn, soybeans, or small grain, the seasonal high water table delays planting in some years. Surface ditches and land leveling help to remove excess water. Erosion is a hazard in the more sloping areas. It can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting. Tilling when the soil is wet causes surface cloddiness and compaction and increases the runoff rate and the hazard of erosion. Returning crop residue to the soil and minimizing tillage help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Suitable species: Reed canarygrass, tall fescue, alsike clover, and ladino clover
Management considerations:
The species that are tolerant of wetness should be selected for planting. Overgrazing or grazing when the soil is too wet reduces forage yields and causes surface compaction and excessive runoff and erosion. Proper stocking rates, rotation grazing, timely deferment of grazing, and applications of fertilizer help to keep the pasture in good condition and control erosion.

Dwellings

Suitability: Generally unsuited because of occasional flooding

Septic tank absorption fields

Suitability: Generally unsuited because of occasional flooding

Interpretive Groups

Land capability classification: IIw
Woodland ordination symbol: 4A

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1987, Clinton County had 218,700 acres of cropland. The farmers in the county harvested 79,005 acres of soybeans, 66,635 acres of corn, 26,543 acres of wheat, and 16,214 acres of hay and green chop (USDC, 1989). The county had 10,230 acres of pasture, which included 2,806 of permanent pasture. The figures for 1974 show a total cropland acreage of 209,430 acres. Since 1974, fewer acres have been used for wheat or pasture and more acres have been used for soybeans.

The main management needs in the county are controlling erosion and surface runoff, maintaining drainage systems in areas of the wetter soils, and improving fertility and tilth.

The soils on 84,194 acres in the county, or about 28 percent of the total acreage, have slopes of 2 percent or more and are susceptible to excessive erosion. In areas of cropland where slopes are 3 to 12 percent and no conservation practices are applied, loss of topsoil averages 16 tons per acre per year. This amount is excessive and represents a soil loss 3 to 5 times the acceptable amount.

Erosion is damaging for three major reasons. First, soil productivity is reduced as the surface layer is eroded away and subsoil material is incorporated into the plow layer. The surface layer contains a much larger amount of organic matter and nutrients than any other horizon within the soil. Second, as erosion continues, tilth deteriorates and the rate of water runoff is increased. Poor tilth results in higher tillage costs because the soil becomes cloddy when wet and puddles and crusts after a heavy rain. As the runoff rate is increased, less water is stored in the soil and available for plant use and the hazard of further erosion is increased. Third, uncontrolled erosion allows sediment to settle in the lower areas of

cropland, road and drainage ditches, streams, lakes, and rivers. Removing this sediment is expensive. Management that controls erosion helps to prevent pollution by sediment and improves water quality for municipal and recreational uses and for fish and wildlife.

The major factors that influence erosion are the rainfall pattern, the soil series, the length and steepness of slopes, the crop rotation and tillage system, and the conservation practices used. The first three factors are set by nature and cannot be changed, but the last two factors can be changed.

Each soil series in the county is assigned a soil erodibility factor, which is based on physical characteristics, such as texture, structure, content of organic matter, content of sodium, and depth. Soils that are low in content of organic matter in the surface layer and have a layer in the subsoil that restricts water intake have a higher soil erodibility factor than other soils. Bluford and Darmstadt soils, which are used for timber, have a high soil erodibility factor. Bluford soils are low in content of organic matter and have a clayey water- and root-restricting layer, and Darmstadt soils have a high content of sodium in the subsoil.

An improved crop rotation and a conservation tillage system keep a protective plant cover on the soil and make use of grasses and legumes or small grain. As more plant residue is left on the surface, the hazard of erosion is reduced. Conservation tillage reduces the runoff rate, increases the rate of water intake, helps to maintain good soil structure, and improves tilth. Clean plowing in the fall and planting row crops, especially soybeans, in a conventional tillage system increase the hazard of erosion. No-till or minimum till with a chisel plow or disc helps to conserve the soil. No-till farming is most effective on gently sloping or moderately sloping soils. It is more effective on somewhat poorly drained to well drained soils than on poorly drained soils. Some areas of poorly drained, nearly level soils, such as those in the Cisne-Huey and Cowden-Piasa complexes, however, are no-tilled with good results.

Other conservation practices that are effective in controlling erosion in the county are terraces, contour stripcropping, contour farming, grassed waterways, diversions, and water- and sediment-control basins. Terraces are effective in reducing the runoff rate and sedimentation on soils with smooth, uniform slopes. They decrease the length of slopes that water travels across in a field. They are a series of ridges and channels that collect runoff and direct it to a tile line or a grassed waterway. In the last 10 years, 134,000 feet of terraces have been constructed in Clinton County. The vast majority of the terraces have been of the parallel tile outlet type. Pike soils, which are mapped in areas of Hagarstown Drift, are especially well suited to terraces and to contour stripcropping. In areas of Darmstadt and Grantfork soils, removing the surface soil in order to make the terrace channel could expose a sodium-affected subsoil, which is more erodible and less productive than the surface layer.

Contour stripcropping helps to control erosion through a combination of a crop rotation and contour farming. Strips of close-growing crops are alternated with row crops on the slopes. For ease of farming, the strips generally parallel one another. According to the Natural Resources Conservation Service, contour farming, which includes both tilling and planting on the contour, can be effective on slopes of as much as 10 percent if slope length is no more than 150 feet. In areas where slopes are 3 to 4 percent, the slope length can be increased to 300 to 400 feet. Grassed waterways in drainageways safely dispose of subsurface runoff. They help to prevent gully erosion and provide outlets for terraces.

The county has 65,783 acres of poorly drained, nearly level upland soils, such as Cisne and Cowden soils; 49,479 acres of poorly drained, nearly level bottom-land soils, such as Birds and Beaucoup soils; and 99,711 acres of somewhat poorly drained, nearly level upland or bottom-land soils, such as Herrick and Wakeland soils. The wetness of these nearly level, somewhat poorly drained or poorly drained soils, which make up 71 percent of the total acreage in the county, can delay planting, damage crops, or reduce productivity. The problems caused by wetness are most severe in areas of the poorly drained soils.

Soil types affect the design of surface and subsurface drainage systems. Soils can be grouped according to permeability, the rate at which water moves through the soils. Generally, the higher the content of clay in the subsoil, the slower the permeability rate of the soil. Of the 214,973 acres of poorly drained or somewhat poorly drained soils in the county, 140,176 acres is rated as slowly permeable or very slowly permeable and 36,514 acres as moderately slowly permeable. The restricted permeability limits the suitability of the soils for subsurface drainage systems. In this county there is almost no tiling of upland soils. Cisne and Cowden are examples of very slowly permeable upland soils in which tiling would be uneconomical. Tile is installed in some areas of Colo, Wakeland, and other bottom-land soils that moderately permeable.

Surface drainage systems are effective and widely used in the county. In the soils on uplands, such as the Cisne-Huey and Virden-Piasa complexes, shallow

surface drainage ditches are maintained throughout the year. Land shaping or leveling can further improve the drainage of these soils. In bottom-land areas, a deeper system of drainage ditches is required to remove the excess water. The surface drains in individual fields are designed as part of a network that empties into larger ditches that in turn empty into a river or creek. A system of levees is used in many areas to protect the bottom land from flooding.

Natural soil fertility ranges from low in timbered soils in some areas in the eastern part of the county to high in soils that formed under grass vegetation in some areas in the western part of the county. Light colored soils, such as Bluford and Wynoose soils, are low in content of organic matter and naturally low in content of nitrogen, phosphorus, and other nutrients. Dark colored soils, such as Herrick and Virden soils, generally are high in natural fertility. Some soils, such as Oconee and Cisne soils, formed under timber and grassland vegetation and have a moderate level of natural fertility. The color and depth of the surface layer in a soil are good indicators of natural fertility, regardless of whether the soil is on an upland or a bottom land.

The darker colored soils in the county generally are higher in calcium and pH than the timbered soils. The degree of soil development is an indicator of pH. Weakly developed soils on flood plains, such as Birds and Beaucoup soils, are less acid than more strongly developed soils on terraces or uplands, such as Ridgway and Oconee soils.

Planting legumes, which fix atmospheric nitrogen in their roots and nodules, and adding livestock waste help to replenish the nutrient supply in the soil. Additions of limestone, nitrogen, phosphorus, potassium, and other nutrients are needed for optimum yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and limestone needed.

Piasa, Darmstadt, Huey, and Grantfork soils have high levels of sodium in one or more horizons. These soils require special treatment. They may show a high pH, but they require applications of limestone to supply the calcium necessary for plant growth. Many farmers in the county apply large amounts of manure to slick spots. The manure improves productivity by increasing nutrient levels and improving the available water capacity.

Soil tilth is an important factor influencing the tillage preparation required in a field, the germination of seeds, the amount of runoff, and the intake of water into the soil. Soils having a surface layer of silt loam that is high in content of organic matter generally are characterized by strong structure and good tilth. Herrick and Bartelso soils are examples of soils in which tilth is generally good. Petrolia soils, which are low in content of organic matter and have a surface layer of silty clay loam, are examples of soils in which tilth is generally poor. In areas of some soils on flood plains, such as Petrolia, Beaucoup, and Wabash soils, tillage when the soils are wet can result in a cloddy seedbed. Timely tillage and harvesting operations are important on these soils. Minimum tillage and maximum use of crop residue and manure are beneficial regardless of the soil type.

Alfalfa is the major forage crop planted for hay that is fed to dairy cattle. Alfalfa is grown with good results on all types of soils, including poorly drained soils. In all areas of hayland and pasture, suitable species should be selected for planting and fertilizer should be applied according to the results of soil tests and the needs of the crop to be grown.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local

office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

The land capability classification of map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slopes range mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime

farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 6. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding and wetness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Woodland Management and Productivity

Clinton County has about 43,200 acres of woodland. About 8,500 acres of the woodland is owned by the U.S. Army Corps of Engineers, and the rest of the acreage is privately owned. Most of the woodland is on the bottom land along the Kaskaskia River and its tributaries. The timber types on this bottom land are silver maple, boxelder, cottonwood, river birch, sycamore, and pin oak. The dominant timber types in the uplands are oak and hickory species.

Table 7 can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed also are subject to erosion. Ratings of the hazard of erosion are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra

precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

The main recreational area in Clinton County is Lake Carlyle, the largest manmade lake in Illinois. A total of 37,470 acres of land was purchased and an additional 25,339 acres of flowage easement land was acquired in Clinton, Bond, and Fayette Counties so that the U.S. Army Corps of Engineers could develop the lake. The majority of that area is in Clinton County, where 20,000 acres of water and 8,249 acres of land are available for recreational purposes. Every year 3.5 to 4.0 million people visit the lake. Hazlet State Park (2,676 acres) and South Shore State Park (833 acres), both operated by the Illinois Department of Conservation, are the two largest parks around the lake. Other recreational areas around the lake include the dam and spillway sites and the Coles Creek, Boulder, and Keyesport access areas.

More than 700 trailer and tent campsites are available around Carlyle Lake. Many areas are suitable for picnicking. Two beaches are open for swimming, and there are four areas where trails are suitable for hiking. The areas on or around the lake provide opportunities for sailing, fishing, and hunting.

Clubhouses are in scattered areas on the more than 20,000 acres of privately owned woodland bordering many creeks and the Kaskaskia River. These areas provide opportunities for camping, hunting, and fishing. The county has two nine-hole golf courses, many city parks, a 165-acre Boy Scout Camp, and many historical and scenic sites.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the

surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Clinton County has a large and varied population of fish and wildlife (fig. 9). Crappie, bluegill, largemouth bass, channel catfish, drum, bullhead, flathead, walleye, white and yellow bass, and carp are the types of fish in the lakes, streams, and ponds of the county. Quail, dove, rabbit, gray and red squirrel, and many white-tail deer inhabit all areas of the county. Pheasants are released and hunted in conservation areas around Carlyle Lake. Waterfowl migrate to areas around the lake and are hunted in season. Fur-bearing animals in the county include raccoon, mink, fox, muskrat, skunk, and some beaver.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management,

Figure 9.—Good habitat for openland, woodland, and wetland wildlife in an area along the Kaskaskia River.

and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the

surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed

onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the AASHTO group index number), shrink-swell potential, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low

maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, rock fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and

topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally

preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The

sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In table 16, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The

classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, greater than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. The soils assigned to group 1 are the most susceptible to soil blowing, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.

8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are depth to the seasonal high water table, the kind of water table, and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalf (*Ud*, meaning humid, plus *alf*, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl*, meaning minimal horizonation, plus *udalf*, the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Hapludalfs.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (Soil Survey Staff, 1999). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

Alvin Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part of the soils and moderately rapid in the lower part
Landscape: Terraces
Landform: Stream terraces
Landform position: Summits
Parent material: Loamy and sandy material deposited by wind or water

Slope: 0 to 2 percent

Taxonomic classification: Coarse-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Alvin silt loam, 0 to 2 percent slopes, frequently flooded, 871 feet south and 2,600 feet east of the northwest corner of sec. 12, T. 1 N., R. 3 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; moderately acid; clear smooth boundary.

Bt1—7 to 17 inches; yellowish brown (10YR 5/4) loam; few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; firm; many faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt2—17 to 26 inches; yellowish brown (10YR 5/4) loam; common medium distinct brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt3—26 to 39 inches; dark yellowish brown (10YR 4/4) loam; common fine distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt4—39 to 50 inches; dark yellowish brown (10YR 4/4) loam; common fine and medium faint light yellowish brown (10YR 6/4) mottles; weak coarse subangular blocky structure; firm; common faint brown (10YR 4/3) clay films on faces of peds; moderately acid; clear smooth boundary.

Cg—50 to 60 inches; dark yellowish brown (10YR 4/4) sandy loam; few fine faint light yellowish brown (10YR 6/4) mottles; massive; firm; moderately acid.

Range in Characteristics

Ap horizon:
Chroma—2 or 3

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4
Texture—loam or sandy loam

C horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4

Atlas Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Parent material: Glacial till
Slope: 5 to 10 percent

Taxonomic classification: Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs

Typical Pedon

Atlas clay loam, 5 to 10 percent slopes, severely eroded, 1,700 feet west and 100 feet south of the northeast corner of sec. 2, T. 3 N., R. 1 W.

Ap—0 to 4 inches; brown (10YR 4/3) clay loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; slightly acid; abrupt smooth boundary.

Bt—4 to 10 inches; dark yellowish brown (10YR 4/4) clay loam; few fine distinct grayish brown (10YR 5/2) and common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; common faint brown (10YR 4/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Btg1—10 to 23 inches; grayish brown (10YR 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—23 to 30 inches; grayish brown (10YR 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg3—30 to 41 inches; grayish brown (2.5Y 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium

subangular blocky structure; firm; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg4—41 to 55 inches; grayish brown (2.5Y 5/2) clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; firm; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

BCtg—55 to 60 inches; grayish brown (2.5Y 5/2) loam; many medium prominent strong brown (7.5YR 5/6) mottles; weak coarse subangular blocky structure; firm; common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: 0 to 18 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3

Bt horizon:
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—2 to 4
Texture—silty clay loam or clay loam

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silty clay loam, clay loam, or silty clay

BCtg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2

Taxadjunct feature: The Atlas soils in this county average less clay in the argillic horizon than is defined as the range for the series. This difference, however, does not alter the usefulness or behavior of the soils.

Ava Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately slow in the upper part of the soils and very slow in the lower part
Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Slope: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Fragiudalfs

Typical Pedon

Ava silt loam, 2 to 5 percent slopes, 2,500 feet west and 1,600 feet south of the northeast corner of sec. 12, T. 3 N., R. 1 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

E—6 to 10 inches; brown (10YR 5/3) silt loam; moderate medium platy structure; friable; few fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt—10 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few faint brown (10YR 5/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

B/E—15 to 20 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; common distinct silt coatings on faces of peds, grayish brown (10YR 5/2) dry; few fine dark accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

2B´t—20 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; few distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; many faint brown (10YR 5/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Btx1—27 to 40 inches; grayish brown (10YR 5/2) silty clay loam; few faint brown (10YR 5/3) and common distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to weak coarse subangular blocky; very firm; many faint silt coatings in channels and on faces of peds, gray (10YR 5/1) dry; few fine dark accumulations of iron and manganese oxide; slightly brittle; about 15 percent sand; strongly acid; gradual smooth boundary.

2Btx2—40 to 49 inches; grayish brown (10YR 5/2) silt loam; few faint brown (10YR 5/3) and common

distinct yellowish brown (10YR 5/6) mottles; moderate coarse prismatic structure parting to weak coarse subangular blocky; very firm; common distinct silt coatings in channels and on faces of peds, gray (10YR 5/1) dry; few fine dark accumulations of iron and manganese oxide; slightly brittle; about 20 percent sand; strongly acid; gradual smooth boundary.

2C—49 to 60 inches; yellowish brown (10YR 5/4) loam; common distinct grayish brown (10YR 5/2) mottles; massive; friable; few fine dark accumulations of iron and manganese oxide; about 35 percent sand; moderately acid.

Range in Characteristics

Depth to a fragipan: 27 to 40 inches
Thickness of the loess: 40 to 54 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

E horizon:
Value—4 or 5
Chroma—3 to 5

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 5
Texture—silt loam or silty clay loam

B/E horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

2B´t horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Btx horizon:
Hue—10YR
Value—5
Chroma—2
Texture—silt loam or silty clay loam

2C horizon:
Hue—10YR
Value—5
Chroma—4
Texture—loam

Taxadjunct feature: The Ava soils in this county do not have the coarseness of structure required for a fragipan, but they do have the morphology (bisequum) that is common in soils with a fragipan. This difference does not alter the usefulness or behavior of the soils.

Bartelso Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Parent material: Loess and lacustrine sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine, mixed, mesic Aquic Argiudolls

Typical Pedon

Bartelso silt loam, rarely flooded, 363 feet north and 2,523 feet west of the southeast corner of sec. 20, T. 1 N., R. 3 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; few very fine roots; slightly acid; abrupt smooth boundary.

A—8 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium platy structure parting to moderate fine granular; friable; few faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

Bt1—12 to 17 inches; brown (10YR 5/3) silty clay loam; common fine distinct gray (10YR 5/1) and common fine faint dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; moderately acid; clear smooth boundary.

2Bt2—17 to 24 inches; brown (10YR 5/3) silty clay; common fine distinct gray (10YR 5/1) and dark yellowish brown (10YR 4/6) mottles; strong medium angular blocky structure; firm; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

2Bt3—24 to 35 inches; brown (10YR 5/3) silty clay; common fine distinct gray (10YR 5/1) and dark yellowish brown (10YR 4/6) mottles; strong coarse angular blocky structure; very firm; few distinct gray (10YR 5/1) clay films on faces of peds;

common fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Bkg1—35 to 45 inches; gray (10YR 5/1) silty clay loam; many fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; very firm; many fine dark accumulations of iron and manganese oxide; common medium light colored accumulations of calcium carbonate; strong effervescence; slightly alkaline; clear smooth boundary.

2Bkg2—45 to 60 inches; gray (10YR 5/1) silt loam; many fine prominent brownish yellow (10YR 6/6) mottles; massive; very firm; many fine dark accumulations of iron and manganese oxide; few fine light colored accumulations of calcium carbonate; strong effervescence; slightly alkaline.

Range in Characteristics

Depth to carbonates: 18 to more than 60 inches
Thickness of the mollic epipedon: 10 to 17 inches
Thickness of the loess: 12 to 25 inches

Ap and A horizons:
Chroma—1 or 2
Texture—silt loam or silty clay loam

AB or BA horizon:
Value—3 or 4
Chroma—1 to 4
Texture—silt loam or silty clay loam

Bt and 2Bt horizons:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Bkg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 to 3
Texture—silt loam or silty clay loam

Beaucoup Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Parent material: Silty slackwater sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Fluvaquentic Haplaquolls

Typical Pedon

Beaucoup silt loam, frequently flooded, 1,815 feet west and 168 feet south of the northeast corner of sec. 34, T. 1 N., R. 5 W.

Ap—0 to 6 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; common fine and medium dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

A—6 to 14 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; few fine distinct brown (7.5YR 4/2) mottles; weak coarse subangular blocky structure; friable; common fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg1—14 to 21 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct brown (7.5YR 4/2) mottles; weak medium prismatic structure; friable; common fine and medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg2—21 to 33 inches; gray (10YR 5/1) silty clay loam; common fine distinct brown (7.5YR 4/2) mottles; weak medium prismatic structure; friable; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg3—33 to 47 inches; gray (10YR 5/1) silty clay loam; common fine distinct brown (10YR 4/3) mottles; moderate medium prismatic structure; friable; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg4—47 to 55 inches; gray (10YR 5/1) silty clay loam; common fine distinct brown (7.5YR 4/2) mottles; moderate medium prismatic structure; friable; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bg5—55 to 60 inches; gray (10YR 5/1) silty clay loam; many fine distinct brown (10YR 4/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 22 inches

Content of clay in the control section: Averages between 27 and 35 percent

A horizon:
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Bg and Cg horizons:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silt loam or silty clay loam

Birds Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Parent material: Silty alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, nonacid, mesic Typic Fluvaquents

Typical Pedon

Birds silt loam, frequently flooded, 50 feet east and 1,000 feet south of the northwest corner of sec. 12, T. 3 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

Cg1—7 to 23 inches; gray (10YR 5/1) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; few fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Cg2—23 to 52 inches; gray (10YR 5/1) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; common medium dark accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Cg3—42 to 60 inches; gray (10YR 5/1) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; many medium dark accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—1 or 2

Cg horizon:
Hue—10YR or 2.5Y
Value—6
Chroma—1 or 2

Blackoar Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Fluvaquentic Haplaquolls

Typical Pedon

Blackoar silt loam, frequently flooded, 500 feet west and 600 feet north of the southeast corner of sec. 28, T. 2 N., R. 5 W.

Ap—0 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, dark grayish brown (10YR 4/2) dry; weak medium granular structure; friable; slightly acid; clear smooth boundary.

A—12 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few fine faint dark grayish brown (10YR 4/2) mottles; weak medium granular structure; friable; few fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Bg1—18 to 27 inches; dark gray (10YR 4/1) silt loam; few fine prominent strong brown (7.5YR 4/6) and few fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg2—27 to 35 inches; gray (10YR 5/1) silt loam; common fine prominent strong brown (7.5YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm; few fine dark accumulations of iron

and manganese oxide; moderately acid; clear smooth boundary.

Bg3—35 to 44 inches; gray (10YR 6/1) silt loam; common medium prominent strong brown (7.5YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; firm; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Cg—44 to 60 inches; light brownish gray (10YR 6/2) silt loam; common medium prominent strong brown (7.5YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; massive; firm; common fine faint accumulations of iron and manganese oxide; moderately acid.

Range in Characteristics

Content of clay in the control section: Averages between 18 and 27 percent

A horizon:
Value—2 or 3
Chroma—1

Bg and Cg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Blair Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Parent material: Silty water-worked sediments and glacial till
Slope: 5 to 15 percent

Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Blair silt loam, 5 to 10 percent slopes, eroded, 900 feet north and 800 feet east of the southwest corner of sec. 22, T. 3 N., R. 1 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

BA—6 to 9 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; common very fine roots; moderately acid; clear smooth boundary.

Bt1—9 to 16 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—16 to 26 inches; brown (10YR 5/3) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and few fine distinct gray (10YR 5/1) mottles; moderate coarse subangular blocky structure parting to strong fine angular blocky; firm; few very fine roots; many faint grayish brown (10YR 5/2) and common distinct brown (7.5YR 4/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—26 to 33 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure; firm; few very fine roots; common faint gray (10YR 5/1) and grayish brown (10YR 5/2) clay films on faces of peds; few faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg2—33 to 42 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) and many medium distinct yellowish brown (10YR 5/4) mottles; weak medium prismatic structure; firm; few very fine roots; common faint gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Btg3—42 to 57 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 15 percent sand; slightly alkaline; clear smooth boundary.

2Btg4—57 to 60 inches; grayish brown (10YR 5/2) loam; common medium distinct yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; few fine dark

accumulations of iron and manganese oxide; about 35 percent sand; slightly alkaline.

Range in Characteristics

Thickness of the loess: 0 to 20 inches

Ap horizon:
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam, silty clay loam, or loam

C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or loam

Bloomfield Series

Depth class: Very deep
Drainage class: Somewhat excessively drained
Permeability: Rapid
Landscape: Terraces
Landform: Stream terraces
Landform position: Side slopes
Parent material: Wind-deposited sandy material
Slope: 10 to 15 percent

Taxonomic classification: Sandy, mixed, mesic Psammentic Hapludalfs

Typical Pedon

Bloomfield fine sand, 10 to 15 percent slopes, 300 feet south and 100 feet east of the northwest corner of sec. 29, T. 2 N., R. 2 W.

A1—0 to 2 inches; dark brown (10YR 3/3) fine sand, brown (10YR 5/3) dry; weak medium granular structure; loose; many fine and medium roots; slightly acid; clear wavy boundary.

A2—2 to 7 inches; dark yellowish brown (10YR 4/4) fine sand; weak fine subangular blocky structure; loose; many fine and medium roots; moderately acid; gradual wavy boundary.

E1—7 to 17 inches; dark yellowish brown (10YR 4/6) fine sand; weak medium subangular blocky structure; loose; many fine and medium and few coarse roots; moderately acid; gradual wavy boundary.

E2—17 to 27 inches; dark yellowish brown (10YR 4/4) fine sand; weak medium subangular blocky structure; loose; common fine and few medium and coarse roots; strongly acid; gradual wavy boundary.

E3—27 to 42 inches; dark yellowish brown (10YR 4/6) fine sand; single grain; loose; few medium roots; few prominent brown (7.5YR 4/4) clay films on faces of peds; strongly acid; gradual wavy boundary.

E and Bt—42 to 60 inches; yellowish brown (10YR 5/6) sand that is single grain and loose (E); many wavy and discontinuous lamellae of strong brown (7.5YR 4/6) loamy fine sand 1/8 to 1 inch thick in the upper part and as much as 1 1/2 inches thick in the lower part (Bt); weak fine and very fine subangular blocky structure (Bt); friable (Bt); moderately acid.

Range in Characteristics

A horizon:
Value—3 or 4
Chroma—3 or 4
Texture—fine sand or loamy fine sand

E horizon:
Value—4 to 6
Chroma—4 to 6
Texture—fine sand or loamy fine sand

E and Bt horizon:
Hue—10YR or 7.5YR in the E part and 7.5YR or 10YR in the Bt part
Value—4 or 5
Chroma—3 to 6
Texture—sand or fine sand in the E part and loamy fine sand or loamy sand in the Bt part

Bluford Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow in the upper part of the soils and slow in the lower part
Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Parent material: Loess and loamy deposits over a paleosol that formed in glacial till
Slope: 0 to 5 percent

Taxonomic classification: Fine, montmorillonitic, mesic Aeric Ochraqualfs

Typical Pedon

Bluford silt loam, 0 to 2 percent slopes, 2,600 feet west and 237 feet south of the northeast corner of sec. 17, T. 3 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; common fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—7 to 12 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct light yellowish brown (10YR 6/4) mottles; moderate medium platy structure; firm; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; common fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt1—12 to 17 inches; brown (10YR 4/3) silty clay loam; common fine faint brown (10YR 5/3) mottles; strong medium subangular blocky structure; firm; common distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; many faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Bt2—17 to 30 inches; dark yellowish brown (10YR 4/4) silty clay; many medium distinct grayish brown (10YR 5/2) mottles; strong medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Bt3—30 to 36 inches; dark yellowish brown (10YR 4/6) silty clay loam; many medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark grayish brown (10YR 4/2) and many distinct brown (10YR 5/3) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

2Btx1—36 to 51 inches; brown (10YR 5/3) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; few distinct brown (7.5YR 4/2) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly brittle; about 5 percent sand; extremely acid; clear smooth boundary.

2Btx2—51 to 60 inches; dark yellowish brown (10YR 4/6) silt loam; common medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; firm; few distinct brown (10YR 4/3) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; slightly brittle; about 10 percent sand; strongly acid.

Range in Characteristics

Thickness of the loess: 30 to 55 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3

E horizon:
Value—5 or 6
Chroma—2 to 4

Bt horizon:
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silty clay

2Btx horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—silt loam or silty clay loam

Cisne Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess and loamy sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Mollic Albaqualfs

Typical Pedon

Cisne silt loam, 858 feet south and 129 feet west of the northeast corner of sec. 22, T. 3 N., R. 1 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; common fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg1—9 to 16 inches; dark grayish brown (10YR 4/2) silt loam; common fine prominent yellowish brown

(10YR 5/8) mottles; weak medium subangular blocky structure; friable; few faint very dark grayish brown (10YR 3/2) organic coatings lining pores; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Eg2—16 to 20 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

Btg1—20 to 29 inches; light brownish gray (10YR 6/2) silty clay; common medium prominent strong brown (7.5YR 5/8) mottles; strong fine prismatic structure parting to strong medium angular blocky; firm; many faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—29 to 38 inches; grayish brown (10YR 5/2) silty clay; common medium prominent strong brown (7.5YR 4/6) mottles; weak coarse prismatic structure parting to weak medium subangular blocky; firm; many faint gray (10YR 5/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Btg3—38 to 42 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine distinct dark brown (7.5YR 3/4) mottles; weak coarse prismatic structure; friable; many faint dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; about 15 percent sand; strongly acid; clear smooth boundary.

2BCg—42 to 51 inches; gray (10YR 6/1) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; friable; common faint gray (10YR 5/1) clay films on faces of peds; few faint silt coatings on faces of peds, light gray (10YR 7/1) dry; common fine and medium dark accumulations of iron and manganese oxide; about 20 percent sand; slightly acid; abrupt smooth boundary.

3Ab—51 to 60 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent dark brown (7.5YR 3/4) and common fine faint gray (10YR 5/1) mottles; massive; firm; common fine dark accumulations of iron and manganese oxide; about 15 percent sand; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 10 inches
Thickness of the loess: 30 to 60 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2

Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

2Btg and 2BCg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

2Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam, silty clay loam, or loam

Colo Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Cumulic Haplaquolls

Typical Pedon

Colo silt loam, frequently flooded, 1,558 feet north and 2,442 feet east of the southwest corner of sec. 5, T. 1 S., R. 5 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few fine dark nodules of iron and manganese oxide; neutral; abrupt smooth boundary.

A1—9 to 18 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine dark nodules of iron and manganese oxide; neutral; clear smooth boundary.

A2—18 to 37 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure; firm; many fine and medium dark accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

A3—37 to 53 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate medium subangular blocky structure; firm; few distinct sand coatings on faces of peds; many fine and medium dark accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bg—53 to 60 inches; dark gray (10YR 4/1) silty clay loam, gray (10YR 5/1) dry; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; few distinct sand coatings on faces of peds; many fine and medium dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 37 to more than 60 inches

A horizon:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silt loam or silty clay loam

Bg horizon:
Value—2 or 3
Texture—silt loam or silty clay loam

Cg horizon:
Hue—10YR or 2.5Y
Value—3 or 4
Chroma—1 or 2
Texture—silt loam or silty clay loam

Cowden Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Mollic Albaqualfs

Typical Pedon

Cowden silt loam, 474 feet north and 345 feet east of the southwest corner of sec. 33, T. 1 N., R. 5 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak medium granular structure; friable; common fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg1—9 to 13 inches; gray (10YR 5/1) silt loam; common medium faint dark gray (10YR 4/1) mottles; moderate medium platy structure; friable; common fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Eg2—13 to 18 inches; grayish brown (10YR 5/2) silt loam; common fine faint dark gray (10YR 4/1) mottles; weak medium granular structure; friable; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

Btg1—18 to 27 inches; grayish brown (10YR 5/2) silty clay; common fine prominent yellowish brown (10YR 5/8) mottles; moderate fine prismatic structure parting to moderate medium angular blocky; firm; common distinct very dark gray (10YR 3/1) organic coatings on faces of peds; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—27 to 34 inches; grayish brown (10YR 5/2) silty clay; common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; few faint very dark gray (10YR 3/1) organic coatings on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg3—34 to 41 inches; light brownish gray (10YR 6/2) silty clay; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg4—41 to 48 inches; gray (10YR 5/1) silty clay;

common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; few faint dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

BCg—48 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; few distinct dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; moderately acid.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 10 inches
Thickness of the loess: 55 to 80 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

Eg horizon:
Value—4 to 6
Chroma—1 or 2

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

BCg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2

Darmstadt Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till
Slope: 0 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Albic Natraqualfs

Typical Pedon

Darmstadt silt loam, in an area of Oconee-Darmstadt complex, 0 to 2 percent slopes, 660 feet south and 1,544 feet east of the center of sec. 9, T. 2 N., R. 3 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine granular structure; friable; common very fine roots; neutral; clear smooth boundary.

E—8 to 11 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate thick platy structure; friable; few very fine roots; few faint dark gray (10YR 4/1) clay films on faces of peds; neutral; abrupt smooth boundary.

Bt—11 to 17 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure; firm; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg1—17 to 24 inches; gray (10YR 6/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6 mottles; weak medium prismatic structure parting to weak coarse subangular blocky; friable; few fine roots; common faint dark gray (10YR 4/1) and few distinct very dark gray (10YR 3/1) clay films on faces of peds; few medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—24 to 32 inches; gray (10YR 6/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure parting to weak coarse subangular blocky; friable; few fine roots; few faint gray (10YR 5/1) and few distinct very dark gray (10YR 3/1) clay films on faces of peds; few medium dark accumulations of iron and manganese oxide; slightly alkaline; clear smooth boundary.

2Bg—32 to 41 inches; gray (10YR 6/1) silt loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure; friable; few faint gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 20 percent sand; slightly alkaline; clear smooth boundary.

2BCg—41 to 47 inches; gray (10YR 6/1) silt loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak very coarse prismatic structure; friable; few faint gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 20 percent sand; slightly alkaline; clear smooth boundary.

2Cg—47 to 60 inches; grayish brown (10YR 5/2) loam;

many medium prominent dark yellowish brown (10YR 4/6) mottles; massive; firm; common medium dark accumulations of iron and manganese oxide; less than 1 percent pebbles; slightly alkaline.

Range in Characteristics

Thickness of the loess: 60 to 80 inches

Ap horizon:
Hue—10YR
Value—3 or 4
Chroma—2 or 3
Texture—silt loam

E horizon:
Hue—10YR
Value—5
Chroma—2
Texture—silt loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silty clay

2Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam, loam, or clay loam

Elco Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Parent material: Loess and a paleosol that formed in glacial till
Slope: 10 to 15 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Elco silty clay loam, 10 to 15 percent slopes, severely eroded, 2,100 feet south and 800 feet west of the northeast corner of sec. 2, T. 2 N., R. 5 W.

Ap—0 to 4 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; common fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine granular structure; friable; common fine roots; neutral; clear smooth boundary.

Bt1—4 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine subangular blocky structure; friable; common fine roots; many faint dark yellowish brown (10YR 3/4) clay films on faces of peds; moderately acid; clear smooth boundary.

2Bt2—14 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; many faint dark yellowish brown (10YR 3/4) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; less than 2 percent pebbles; moderately acid; clear smooth boundary.

2Bt3—24 to 30 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; weak medium and coarse subangular blocky structure; friable; common faint dark yellowish brown (10YR 3/4) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; less than 2 percent pebbles; moderately acid; clear smooth boundary.

2Bt4—30 to 36 inches; dark yellowish brown (10YR 4/4) silt loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; friable; few faint yellowish brown (10YR 5/4) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; less than 2 percent pebbles; slightly acid; clear smooth boundary.

3Bt5—36 to 52 inches; brown (10YR 5/3) clay loam; common medium faint grayish brown (10YR 5/2) mottles; weak medium prismatic structure; friable; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; 5 percent pebbles; neutral; clear smooth boundary.

3Btg—52 to 60 inches; grayish brown (10YR 5/2) clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure; friable; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; 5 percent pebbles; neutral.

Range in Characteristics

Thickness of the loess: 20 to 40 inches

Ap horizon:
Value—3 or 4
Chroma—2 to 4
Texture—silt loam or silty clay loam

Bt and 2Bt horizons:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam or silty clay loam

3Bt horizon:
Hue—10YR or 2.5Y
Value—3 to 6
Chroma—2 or 3
Texture—clay loam, silty clay loam, or silty clay

Geff Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landscape: Terraces
Landform: Stream terraces
Landform position: Summits
Parent material: Loess and loamy outwash
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Geff silt loam, 0 to 2 percent slopes, occasionally flooded, 2,200 feet south and 1,500 feet east of the northwest corner of sec. 32, T. 1 N., R. 4 W.

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; few very fine roots; few fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—5 to 12 inches; brown (10YR 5/3) silt loam; common fine distinct yellowish brown (10YR 5/6) and common medium faint light brownish gray (10YR 6/2) mottles; moderate thick platy and moderate medium subangular blocky structure; friable; common medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—12 to 20 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; common medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt2—20 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and few fine distinct dark yellowish brown (10YR 4/6) mottles; strong fine subangular blocky structure; friable; many distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; common medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt3—26 to 33 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct grayish brown (10YR 5/2) and dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; many distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; common medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2Bt4—33 to 37 inches; dark yellowish brown (10YR 4/4) silt loam; common fine distinct dark yellowish brown (10YR 4/6) and few fine distinct grayish brown (10YR 5/2) mottles; moderate fine prismatic structure parting to moderate fine subangular blocky; friable; common faint brown (10YR 4/3) clay films on faces of peds; many distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; few medium dark accumulations of iron and manganese oxide; about 20 percent sand; strongly acid; clear smooth boundary.

2BC—37 to 50 inches; dark yellowish brown (10YR 4/4) silt loam; many fine distinct dark yellowish brown (10YR 4/6/), few medium distinct grayish brown (10YR 5/2), and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; common distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; common medium irregular accumulations of iron and manganese oxide; about 20 percent sand; strongly acid; clear smooth boundary.

2C—50 to 60 inches; dark yellowish brown (10YR 4/4) loam; many fine distinct dark yellowish brown (10YR 4/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure; friable; few faint brown (10YR 4/3) clay films on faces of peds; few distinct silt coatings on faces of peds, light gray (10YR 7/2) dry; common medium dark accumulations of iron and manganese oxide; about 35 percent sand; strongly acid.

Range in Characteristics

Thickness of the loess: 30 to 40 inches

Ap horizon:
Value—3 to 5
Chroma—1 or 2

E horizon:
Value—5 or 6
Chroma—2 or 3

Bt horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam, silty clay loam, or clay loam

2Bt and 2BC horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, or loam

2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—loam, sandy loam, loamy sand, or sand

Grantfork Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits and head slopes
Parent material: Loamy sediments and glacial till
Slope: 2 to 10 percent

Taxonomic classification: Fine-loamy, mixed, mesic, sloping Aeric Ochraqualfs

Typical Pedon

Grantfork silt loam, in an area of Blair-Grantfork complex, 2 to 5 percent slopes, eroded, 600 feet west and 2,540 feet south of the northeast corner of sec. 29, T. 3 N., R. 1 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; common fine faint brown (10YR 4/3) mottles; moderate fine granular structure; friable; common very fine roots; neutral; abrupt smooth boundary.

Bt—5 to 11 inches; brown (10YR 4/3) silty clay loam; common medium distinct gray (10YR 5/1) and few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; friable; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—11 to 18 inches; gray (10YR 5/1) silty clay loam; common medium prominent yellowish red (5YR 4/6) and few fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium subangular blocky structure; firm; few very fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2Btg2—18 to 23 inches; gray (10YR 5/1) clay loam; few fine prominent yellowish red (5YR 4/6) and common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to weak medium subangular blocky structure; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; 4 percent pebbles; moderately acid; clear smooth boundary.

2Btgn1—23 to 29 inches; gray (10YR 5/1) clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure; firm; few faint gray (10YR 5/1) and grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; 5 percent pebbles; neutral; clear smooth boundary.

2Btgn2—29 to 40 inches; gray (10YR 5/1) clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure; firm; few faint gray (10YR 5/1) and grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; 5 percent pebbles; slightly alkaline; clear smooth boundary.

2Btgn3—40 to 60 inches; gray (10YR 5/1) clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few faint gray (10YR 5/1) and grayish brown (10YR 5/2) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; 5 percent pebbles; slightly alkaline.

Range in Characteristics

Ap horizon:
Value—3 or 4
Chroma—2 or 3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam, silty clay loam, loam, or clay loam
Exchangeable sodium content—15 to 25 percent in the lower part

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam, loam, or clay loam
Exchangeable sodium content—15 to 25 percent

Harrison Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Slope: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Argiudolls

Typical Pedon

Harrison silt loam, 2 to 5 percent slopes, 490 feet west and 1,917 feet south of the northeast corner of sec. 8, R. 1 N., R. 5 W.

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; neutral; abrupt smooth boundary.

BA—10 to 13 inches; brown (10YR 4/3) silt loam; strong fine subangular blocky structure; friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt1—13 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; many faint dark brown (10YR 3/3) clay films on faces of peds; slightly acid; clear smooth boundary.

Bt2—21 to 32 inches; brown (10YR 4/3) silty clay loam; moderate fine prismatic structure parting to moderate fine subangular blocky; firm; common prominent dark brown (10YR 3/3) and common distinct grayish brown (10YR 5/2) clay films on faces of peds; few medium rounded nodules of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg1—32 to 42 inches; grayish brown (10YR 5/2) silt loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure; friable; common faint grayish brown (10YR 5/2) and few faint brown (10YR 4/3) clay films on faces of peds; common medium dark nodules of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg2—42 to 60 inches; grayish brown (10YR 5/2) silt loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure; friable; common faint grayish brown (10YR 5/2) and few faint brown (10YR 4/3) clay films on faces of peds; common fine dark nodules of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 17 inches
Thickness of the loess: 40 to 60 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

Bt horizon:
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

2Bt or 2BC horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam, silt loam, loam, or clay loam

Herrick Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Aquic Argiudolls

Typical Pedon

Herrick silt loam, 0 to 2 percent slopes, 1,584 feet

south and 321 feet east of the northwest corner of sec. 5, T. 1 N., R. 5 W.

Ap—0 to 13 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) and dark gray (10YR 4/1) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

E—13 to 18 inches; very dark gray (10YR 3/1) silt loam; weak medium platy structure; friable; common faint silt coatings on faces of peds, grayish brown (10YR 5/2) dry; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—18 to 23 inches; dark yellowish brown (10YR 4/4) silty clay; strong medium prismatic structure parting to strong medium angular blocky; very firm; many prominent very dark gray (10YR 3/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt2—23 to 36 inches; olive brown (2.5Y 4/4) silty clay loam; few fine prominent dark gray (N 4/0) mottles; strong medium prismatic structure parting to strong medium subangular blocky; firm; many prominent very dark gray (10YR 3/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—36 to 42 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to strong medium angular blocky; firm; many distinct very dark gray (10YR 3/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt4—42 to 51 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; many distinct dark gray (10YR 4/1) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BC—51 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; firm; few distinct dark gray (10YR 4/1) clay films on faces of peds; slightly acid;

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: 50 to 80 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—3 or 4
Chroma—1 or 2

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silty clay

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture—silt loam or loam

Hickory Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Uplands
Landform: Till plains
Landform position: Side slopes
Parent material: Glacial till that in some areas has a mantle of loess as much as 20 inches thick
Slope: 10 to 30 percent

Taxonomic classification: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Hickory loam, 15 to 30 percent slopes, 1,716 feet west and 2,323 feet south of the northeast corner of sec. 12, T. 3 N., R. 1 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; slightly acid; abrupt smooth boundary.

E—6 to 9 inches; brown (10YR 5/3) silt loam; moderate thin platy structure; friable; moderately acid; clear smooth boundary.

Bt1—9 to 16 inches; dark yellowish brown (10YR 4/6) clay loam; strong medium subangular blocky structure; firm; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine pebbles; very strongly acid; clear smooth boundary.

Bt2—16 to 22 inches; dark yellowish brown (10YR 4/6) clay loam; few fine prominent pale brown (10YR 6/3) mottles; strong medium prismatic structure

parting to strong medium subangular blocky; firm; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few pebbles; very strongly acid; clear smooth boundary.

Bt3—22 to 29 inches; yellowish brown (10YR 5/8) clay loam; many coarse prominent grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark yellowish brown (10YR 4/4) and common prominent gray (10YR 5/1) clay films on faces of peds; few pebbles; very strongly acid; clear smooth boundary.

Bt4—29 to 38 inches; dark yellowish brown (10YR 4/6) clay loam; few medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; firm; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; few pebbles; moderately acid; clear smooth boundary.

BC—38 to 49 inches; yellowish brown (10YR 5/4) clay loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure; very firm; few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; few pebbles; slightly acid; clear smooth boundary.

C—49 to 60 inches; yellowish brown (10YR 5/4) loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; massive; very firm; common fine and medium dark accumulations of iron and manganese oxide; few pebbles; slight effervescence; neutral.

Range in Characteristics

Depth to carbonates: 40 to 60 inches
Thickness of the loess: 0 to 20 inches

A horizon:
Value—2 to 4
Chroma—2 or 3
Texture—silt loam, loam, or clay loam

E horizon:
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—silty clay loam or clay loam

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—4 to 6
Texture—loam or clay loam

Hoyleton Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits and side slopes
Parent material: Loess and silty or loamy deposits over a paleosol that formed in glacial till
Slope: 0 to 5 percent

Taxonomic classification: Fine, montmorillonitic, mesic Aquollic Hapludalfs

Typical Pedon

Hoyleton silt loam, 0 to 2 percent slopes, 1,900 feet west and 1,440 feet north of the southeast corner of sec. 20, T. 3 N., R. 1 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and very fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

E1—8 to 12 inches; brown (10YR 5/3) silt loam; moderate thick platy structure; friable; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine faint very dark grayish brown (10YR 3/2) and dark brown (10YR 3/3) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

E2—12 to 18 inches; pale brown (10YR 6/3) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate thick platy structure; friable; many distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt1—18 to 23 inches; brown (10YR 5/3) silty clay; common medium prominent reddish brown (5YR 4/4) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong medium subangular blocky; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; few faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine dark

accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—23 to 30 inches; brown (10YR 5/3) silty clay; few medium prominent reddish brown (5YR 4/4) and common fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure; firm; common faint grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt3—30 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few faint grayish brown (10YR 5/2) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2BC—41 to 54 inches; brown (10YR 5/3) silt loam; many medium distinct gray (10YR 5/1), common fine distinct yellowish brown (10YR 5/6), and common fine faint brown (10YR 4/3) mottles; weak medium prismatic structure; friable; common medium dark accumulations of iron and manganese oxide; about 20 percent sand; moderately acid; clear smooth boundary.

2C—54 to 60 inches; brown (10YR 5/3) clay loam; many distinct brown (7.5YR 5/4) and many faint brown (10YR 4/3) mottles; massive; firm; common medium dark accumulations of iron and manganese oxide; about 30 percent sand; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 10 inches
Thickness of the loess: 30 to 50 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—4 to 6
Chroma—3 or 4

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—2 or 3
Texture—silty clay loam or silty clay

2BC horizon:
Value—5 or 6
Chroma—2 or 3
Texture—clay loam, silt loam, or silty clay loam

2C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 to 3
Texture—clay loam or silty clay loam

Huey Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess and erosional sediments over a paleosol that formed in glacial till
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Natraqualfs

Typical Pedon

Huey silt loam, in an area of Cisne-Huey complex, 1,900 feet west and 200 feet north of the southeast corner of sec. 25, T. 3 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; very friable; few very fine roots; moderately acid; clear smooth boundary.

E—7 to 12 inches; grayish brown (10YR 5/2) silt loam; moderate very thick platy structure; very friable; common very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg—12 to 15 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/6) mottles; strong medium prismatic structure parting to strong medium subangular blocky; firm; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btgn1—15 to 24 inches; gray (5Y 6/1) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate coarse subangular blocky; firm; common prominent gray (10YR 5/1) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; slightly alkaline; clear smooth boundary.

Btgn2—24 to 40 inches; gray (5Y 6/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few prominent gray (10YR 5/1) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

BCgn—40 to 51 inches; gray (5Y 6/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; many medium dark accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

2Cgn—51 to 60 inches; gray (5Y 5/1) silty clay loam; common medium faint gray (5Y 6/1) and common medium prominent brown (10YR 4/3) mottles; massive; firm; many coarse dark accumulations of iron and manganese oxide; few pebbles; moderately alkaline.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Texture—silt loam or silt

Btg and Btgn horizons:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Exchangeable sodium content—15 to 25 percent in the Btgn horizon

BCgn horizon:
Hue—5Y or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam
Exchangeable sodium content—15 to 25 percent

Cgn horizon:
Hue—5Y or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam
Exchangeable sodium content—15 to 25 percent

Hurst Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landscape: Terraces
Landform: Lake plains
Landform position: Summits and terrace divides
Parent material: Loess and clayey lacustrine sediments
Slope: 0 to 5 percent

Taxonomic classification: Fine, montmorillonitic, mesic Aeric Ochraqualfs

Typical Pedon

Hurst silt loam, 0 to 2 percent slopes, rarely flooded, 1,795 feet west and 1,729 feet south of the northeast corner of sec. 34, T. 1 N., R. 4 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common fine and medium dark nodules of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 12 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate thick platy structure; friable; common fine and medium dark nodules of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt—12 to 27 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak medium subangular blocky; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; common medium dark nodules and common medium dark accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

2Btg1—27 to 38 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate fine angular blocky; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium dark nodules of iron and manganese oxide; neutral; clear smooth boundary.

2Btg2—38 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to strong coarse angular blocky; firm many faint grayish brown (2.5Y 5/2) clay films on faces of peds; common

fine and medium dark nodules of iron and manganese oxide and common coarse light colored concretions of calcium carbonate; neutral.

Range in Characteristics

Depth to carbonates: 38 to more than 60 inches
Thickness of the loess: 10 to 20 inches

Ap or A horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

E horizon:
Value—5 or 6
Chroma—2 or 3
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 or 3
Texture—silty clay loam or silty clay

Iva Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Aeric Ochraqualfs

Typical Pedon

Iva silt loam, 132 feet south and 2,719 feet west of the northeast corner of sec. 19, T. 1 N., R. 4 W.

Ap—0 to 11 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common fine and medium dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—11 to 17 inches; brown (10YR 5/3) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate fine granular structure; friable; common distinct dark gray (10YR 4/1) organic coatings on faces of peds; common fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—17 to 27 inches; brown (10YR 5/3) silty clay loam; common fine faint grayish brown (10YR 5/2) and common fine distinct dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to strong fine angular blocky; firm; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—27 to 40 inches; brown (10YR 5/3) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; firm; many faint grayish brown (10YR 5/2) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BC—40 to 49 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent brown (7.5YR 4/4) mottles; moderate medium prismatic structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

C—49 to 60 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent strong brown (7.5YR 4/6) mottles; massive; firm; few faint dark grayish brown (2.5Y 4/2) clay films lining pores; few fine dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: 55 to 80 inches

Ap horizon:
Value—3 to 5
Chroma—1 or 2

E horizon:
Value—5 or 6
Chroma—2 or 3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 or 3
Texture—silty clay loam or silt loam

C horizon:
Hue—2.5Y or 10YR
Value—5 or 6

Chroma—2 to 4
Texture—silt loam or silt

Lakaskia Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Parent material: Loess and lacustrine sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine, mixed, mesic Typic Argiaquolls

Typical Pedon

Lakaskia silt loam, rarely flooded, 2,297 feet west and 2,508 feet south of the northeast corner of sec. 27, T. 1 N., R. 4 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; weak fine granular structure; friable; few fine dark nodules of iron and manganese oxide; neutral; abrupt smooth boundary.

A—8 to 13 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine angular blocky structure; friable; few fine dark nodules of iron and manganese oxide; neutral; abrupt smooth boundary.

Btg1—13 to 17 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure; firm; many distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine dark nodules of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—17 to 26 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure; firm; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few medium dark nodules of iron and manganese oxide; neutral; clear smooth boundary.

2Btg3—26 to 36 inches; grayish brown (2.5Y 5/2) silty clay; common fine distinct light olive brown (2.5Y 5/6) mottles; weak medium prismatic structure; firm; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine dark nodules of iron and manganese oxide; slightly alkaline; gradual smooth boundary.

2Btg4—36 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure; firm; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few coarse dark concretions and few fine dark nodules of iron and manganese oxide; slight effervescence; slightly alkaline; clear smooth boundary.

2Cg—50 to 60 inches; gray (10YR 5/1) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; massive; firm; few distinct grayish brown (2.5Y 5/2) clay films lining pores; few coarse dark concretions and few fine dark nodules of iron and manganese oxide; slight effervescence; slightly alkaline.

Range in Characteristics

Depth to carbonates: 36 to 60 inches
Thickness of the mollic epipedon: 13 to 18 inches
Profile feature: A BCg horizon in some pedons

Ap and A horizons:
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silt clay loam

Btg horizon:
Hue—2.5Y, 10YR, or neutral
Value—3 to 6
Chroma—0 to 2
Texture—silty clay loam or silty clay

2Cg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

Landes Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderately rapid in the upper part of the soils and rapid in the lower part
Landscape: Flood plains
Landform: High flood plains
Landform position: Bottoms
Parent material: Loamy and sandy alluvium
Slope: 0 to 2 percent

Taxonomic classification: Coarse-loamy, mixed, mesic Fluventic Hapludolls

Typical Pedon

Landes fine sandy loam, 0 to 2 percent slopes, frequently flooded, 198 feet east and 1,399 feet south of the northwest corner of sec. 2, T. 1 S., R. 5 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam, grayish brown (10YR 5/2) dry; weak fine granular structure; friable; slightly acid; abrupt smooth boundary.

A—8 to 12 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak thick platy structure; friable; common faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BA—12 to 20 inches; dark brown (10YR 3/3) fine sandy loam; weak medium subangular blocky structure; very friable; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bw—20 to 30 inches; dark brown (10YR 3/3) loamy fine sand; weak medium subangular blocky structure; very friable; common faint dark brown (10YR 3/3) organic coatings on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BC—30 to 39 inches; dark yellowish brown (10YR 3/4) loamy fine sand; weak medium subangular blocky structure; very friable; few faint dark yellowish brown (10YR 3/4) clay films on faces of peds; areas of uncoated sand grains on faces of peds; slightly acid; clear smooth boundary.

C—39 to 60 inches; brown (7.5YR 4/4) loamy fine sand; few fine distinct brown (10YR 5/3) mottles; single grain; loose; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 20 inches

Ap and A horizons:
Value—2 or 3
Chroma—1 to 3
Texture—fine sandy loam, very fine sandy loam, or sandy loam

Bw horizon:
Value—3 or 4
Chroma—3 or 4
Texture—fine sandy loam or loamy fine sand

C horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 or 5
Texture—loamy fine sand, fine sand, or sandy loam

Meadowbank Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part of the soils and rapid in the lower part
Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and terrace divides
Parent material: Loess and loamy and sandy outwash
Slope: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Argiudolls

Typical Pedon

Meadowbank silt loam, 2 to 5 percent slopes, rarely flooded, 700 feet west and 100 feet north of the southeast corner of sec. 7, T. 1 S., R. 5 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few fine roots; moderately acid; clear smooth boundary.

A—9 to 13 inches; very dark gray (10YR 3/1) silt loam, dark gray (10YR 4/1) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; few very fine roots; many faint very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

BA—13 to 17 inches; dark brown (10YR 3/3) silt loam; moderate medium subangular blocky structure; friable; few very fine roots; many distinct very dark gray (10YR 3/1) organic coatings on faces of peds; slightly acid; clear smooth boundary.

Bt1—17 to 25 inches; brown (10YR 4/3) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) organic coatings on faces of peds; neutral; clear smooth boundary.

Bt2—25 to 34 inches; brown (10YR 4/3) silty clay loam; moderate medium prismatic structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) and few distinct very dark gray (10YR 3/1) clay films on faces of peds; neutral; clear smooth boundary.

2Bt3—34 to 40 inches; brown (10YR 4/3) loam; moderate medium prismatic structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

2Bt4—40 to 45 inches; brown (10YR 4/3) loam; moderate medium prismatic structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

2BC—45 to 53 inches; brown (10YR 4/3) sandy loam; moderate medium prismatic structure; friable; few very fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; slightly acid; clear smooth boundary.

2C—53 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; weak medium and coarse prismatic structure; very friable or loose; few very fine roots; few distinct very dark grayish brown (10YR 3/2) coatings on faces of peds in the upper part; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 13 to 19 inches
Thickness of the loess: 29 to 40 inches

Ap and A horizons:
Value—2 or 3
Chroma—2 or 3

AB or BA horizon:
Value—2 or 3
Chroma—2 or 3
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 6

2Bt and 2BC horizons:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—clay loam, silty clay loam, or sandy loam

2C horizon:
Value—4 or 5
Chroma—4 to 6
Texture—loamy sand, sandy loam, or sand

Muren Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Moderate
Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Parent material: Loess
Slope: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Muren silt loam, 2 to 5 percent slopes, eroded, 600 feet south and 300 feet east of the northwest corner of sec. 2, T. 2 N., R. 5 W.

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; neutral; abrupt smooth boundary.

Bt1—5 to 14 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine distinct grayish brown (10YR 5/2) mottles; moderate fine prismatic structure parting to moderate medium and fine subangular blocky; firm; common prominent silt coatings on faces of peds, light gray (10YR 7/1) dry; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—14 to 20 inches; brown (10YR 5/3) silty clay loam; common medium faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; many distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; many faint yellowish brown (10YR 5/4) clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—20 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to weak coarse subangular blocky; firm; few distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; many faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt4—28 to 46 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; firm; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt5—46 to 54 inches; brown (7.5YR 4/4) silt loam; many fine prominent grayish brown (10YR 5/2) mottles; weak coarse prismatic structure; firm; few faint dark brown (7.5YR 3/4) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt6—54 to 60 inches; brown (7.5YR 5/4) silt loam; many medium distinct dark yellowish brown (10YR

4/4) mottles; weak coarse prismatic structure; firm; few faint dark brown (7.5YR 3/4) clay films on faces of peds; common fine and medium dark accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the loess: 55 to 80 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam or silty clay loam

C horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—3 or 4
Texture—silt loam or silt

Newberry Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits and shallow, closed depressions
Parent material: Loess and silty and loamy deposits over a paleosol that formed in glacial till
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Mollic Ochraqualfs

Typical Pedon

Newberry silt loam, 1,300 feet west and 2,300 feet south of the northeast corner of sec. 31, T. 3 N., R. 3 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few medium distinct gray (10YR 5/1) and few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate fine granular structure; friable; common fine roots; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Eg—9 to 17 inches; gray (10YR 5/1) silt loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine and medium dark nodules of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg1—17 to 24 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine and medium subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) and few faint very dark gray (10YR 3/1) clay films on faces of peds; very few distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; few medium dark nodules of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—24 to 32 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; firm; few fine roots; common faint dark gray (10YR 4/1) and few faint very dark gray (10YR 3/1) clay films on faces of peds; few distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine and medium dark nodules of iron and manganese oxide; moderately acid; clear smooth boundary.

Btg3—32 to 43 inches; gray (10YR 5/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to strong medium subangular blocky; firm; few fine roots; few faint very dark gray (10YR 3/1) and dark gray (10YR 4/1) clay films on faces of peds; very few faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few medium dark nodules of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg4—43 to 53 inches; gray (10YR 5/1) silty clay loam; many fine prominent dark yellowish brown (10YR 4/6) mottles; strong medium prismatic structure parting to strong medium subangular blocky; firm; few faint dark gray (10YR 4/1) and very few faint very dark gray (10YR 3/1) clay films on faces of peds; few distinct silt coatings on faces of peds, light gray (10YR 7/1) dry; few medium dark nodules of iron and manganese oxide; slightly acid; clear smooth boundary.

2Btg5—53 to 60 inches; gray (10YR 5/1) silty clay loam; common fine and medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; 10 to 15 percent sand; very few faint dark gray (10YR 4/1) and very dark

gray (10YR 3/1) clay films on faces of peds; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; few fine dark accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 8 to 10 inches
Thickness of the loess: 30 to 55 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

Eg horizon:
Value—4 to 6
Chroma—1 or 2

Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2
Texture—silty clay or silt loam

2BCg horizon:
Hue—2.5Y or 10YR
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

2Cg horizon:
Hue—2.5Y or 10YR
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Oconee Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits and shoulders
Parent material: Loess
Slope: 0 to 5 percent

Taxonomic classification: Fine, montmorillonitic, mesic Udollic Ochraqualfs

Typical Pedon

Oconee silt loam, 0 to 2 percent slopes, 1,500 feet west and 2,000 feet north of the southeast corner of sec. 4, T. 1 N., R. 4 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

E—9 to 18 inches; light brownish gray (10YR 6/2) silt loam; moderate thick platy structure parting to weak medium subangular blocky; friable; few fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Bt—18 to 25 inches; brown (10YR 5/3) silty clay loam; common medium distinct dark yellowish brown (10YR 4/6) and few fine faint light brownish gray (10YR 6/2) mottles; moderate fine prismatic structure; firm; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—25 to 33 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) and few fine faint light brownish gray (10YR 6/2) mottles; weak medium prismatic structure; firm; few faint dark gray (10YR 4/1) and common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—33 to 38 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent dark yellowish brown (10YR 4/6) mottles; weak medium prismatic structure; firm; few prominent dark grayish brown (10YR 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

BC—38 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; weak coarse prismatic structure; firm; few faint grayish brown (10YR 5/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

C—47 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; massive; firm; common medium dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 10 inches
Thickness of the loess: 55 to 80 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—5 or 6
Chroma—1 or 2

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 or 3
Texture—silty clay loam or silty clay

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Okaw Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Parent material: Clayey lacustrine sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Okaw silt loam, rarely flooded, 2,500 feet east and 500 feet north of the southwest corner of sec. 9, T. 1 S., R. 5 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

Eg—8 to 15 inches; grayish brown (10YR 5/2) silt loam; few fine prominent brown (7.5YR 4/4) mottles; moderate medium platy structure; firm; few fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

BEg—15 to 18 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few faint grayish brown (2.5Y 5/2) clay films on faces of peds; common distinct silt coatings on faces of peds, light brownish gray (10YR 6/2) dry; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

2Btg1—18 to 26 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; common faint silt coatings on faces of peds, light brownish gray (10YR 6/2) dry; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

2Btg2—26 to 37 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; few faint silt coatings on faces of peds, light brownish gray (10YR 6/2) dry; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

2Btg3—37 to 49 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

2BCg—49 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent brown (7.5YR 4/4) mottles; moderate coarse subangular blocky structure; firm; few fine dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: 10 to 20 inches

Ap and Eg horizons:
Value—4 or 5
Chroma—1 or 2
Texture—silt loam or silty clay loam

BEg horizon:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam or silty clay

2Btg horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 or 2
Texture—silty clay loam or silty clay

2BCg and 2Cg horizons:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—2 or 3
Texture—silty clay loam or silty clay

Petrolia Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Parent material: Silty alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, nonacid, mesic Typic Fluvaquents

Typical Pedon

Petrolia silty clay loam, frequently flooded, 800 feet west and 400 feet south of the center of sec. 29, T. 1 N., R. 3 W.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) silty clay loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; very friable; few very fine roots; neutral; clear smooth boundary.

Cg1—6 to 21 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few very fine roots; common faint dark gray (10YR 4/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Cg2—21 to 46 inches; dark gray (10YR 4/1) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; friable; few very fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Cg3—46 to 60 inches; dark gray (10YR 4/1) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; common faint dark gray (10YR 4/1) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Ap horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 or 2
Texture—silt loam or silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam or silt loam

Piasa Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Mollic Natraqualfs

Typical Pedon

Piasa silt loam, in an area of Virden-Piasa complex, 1,887 feet west and 184 feet south of the northeast corner of sec. 6, T. 1 N., R. 5 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

E—8 to 14 inches; dark gray (10YR 4/1) silt loam; moderate medium subangular blocky structure; friable; few fine faint very dark gray (10YR 3/1) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btgn1—14 to 21 inches; dark grayish brown (10YR 4/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) mottles; moderate fine subangular blocky structure; friable; common faint very dark gray (10YR 3/1) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; violent effervescence; moderately alkaline; clear smooth boundary.

Btgn2—21 to 33 inches; dark grayish brown (10YR 4/2) silty clay loam; many medium prominent dark

yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate fine subangular blocky; firm; many faint very dark gray (10YR 3/1) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; violent effervescence; moderately alkaline; clear smooth boundary.

Btgn3—33 to 41 inches; dark grayish brown (10YR 4/2) silty clay loam; many medium prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure; firm; many faint dark gray (10YR 4/1) clay films and few faint very dark gray (10YR 3/1) organic coatings on faces of peds; common medium dark accumulations of iron and manganese oxide; violent effervescence; moderately alkaline; clear smooth boundary.

Btgn4—41 to 49 inches; grayish brown (10YR 5/2) silty clay loam; many medium prominent yellowish brown (10YR 5/6) mottles; strong medium prismatic structure; firm; common faint dark gray (10YR 4/1) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; violent effervescence; moderately alkaline; clear smooth boundary.

BCgn—49 to 60 inches; dark grayish brown (10YR 4/2) silt loam; many medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; firm; few distinct dark gray (10YR 4/1) clay films lining pores; common medium dark accumulations of iron and manganese oxide; violent effervescence; moderately alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 7 to 10 inches
Thickness of the loess: 55 to 80 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2

E horizon:
Value—4 or 5
Chroma—1 or 2

Btgn horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Exchangeable sodium content—15 to 25 percent

BCgn horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam
Exchangeable sodium content—15 to 25 percent

Cgn horizon:
Hue—2.5Y, 10YR, or neutral
Value—4 to 6
Chroma—0 to 2
Texture—silt loam or silty clay loam
Exchangeable sodium content—15 to 25 percent

Pike Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landscape: Uplands
Landform: Moraines
Landform position: Summits and side slopes
Parent material: Loess and a paleosol that formed in outwash
Slope: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, mesic Ultic Hapludalfs

Typical Pedon

Pike silt loam, 2 to 5 percent slopes, eroded, 1,505 feet south and 1,148 feet east of the northwest corner of sec. 10, T. 1 N., R. 3 W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, brown (10YR 5/3) dry; moderate thin platy structure; friable; few fine dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt1—9 to 14 inches; dark yellowish brown (10YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; common prominent brown (7.5YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt2—14 to 24 inches; dark yellowish brown (10YR 4/6) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many prominent brown (7.5YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2Bt3—24 to 37 inches; brown (7.5YR 4/4) silty clay loam; moderate medium platy structure; firm; many faint brown (7.5YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 15 percent sand; strongly acid; clear smooth boundary.

2Bt4—37 to 60 inches; brown (7.5YR 4/4) loam; moderate coarse prismatic structure; firm; common faint brown (7.5YR 4/3) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 15 percent sand; moderately acid.

Range in Characteristics

Thickness of the loess: 40 to 60 inches

Ap horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 or 4
Texture—silt loam or silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—4 to 6
Texture—silt loam, silty clay loam, clay loam, loam, or sandy clay loam

Racoon Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and footslopes
Parent material: Mixture of loess and silty local alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Ochraqualfs

Typical Pedon

Racoon silt loam, occasionally flooded, 2,521 feet south and 871 feet east of the northwest corner of sec. 22, T. 1 N., R. 3 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; common fine and medium rounded nodules of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg1—6 to 15 inches; grayish brown (10YR 5/2) silt loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium platy structure; friable; few faint dark grayish brown (10YR 4/2) organic coatings on faces of peds; many fine and medium dark accumulations and few coarse rounded nodules of iron and manganese oxide; moderately acid; clear smooth boundary.

Eg2—15 to 23 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct yellowish brown (10YR 5/4) mottles; moderate medium platy structure; friable; few faint grayish brown (10YR 5/2) coatings on faces of peds; many fine and medium dark accumulations and few coarse rounded nodules of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—23 to 30 inches; light brownish gray (10YR 6/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; common faint grayish brown (10YR 5/2) clay films on faces of peds; many fine and medium and few coarse rounded nodules of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—30 to 45 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; many faint dark gray (10YR 4/1) clay films on faces of peds; many fine and medium and few coarse rounded nodules of iron and manganese oxide; strongly acid; clear smooth boundary.

Cg—45 to 60 inches; grayish brown (10YR 5/2) silty clay loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; common faint dark gray (10YR 4/1) clay films lining pores; many medium and coarse rounded nodules of iron and manganese oxide; neutral.

Range in Characteristics

Profile feature: A BEg or BCg horizon in some pedons

Ap horizon:
Value—4 to 6

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2

Texture—silty clay loam, loam, or clay loam

Ridgway Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate in the upper part of the soils and rapid in the lower part
Landscape: Terraces
Landform: Stream terraces
Landform position: Summits and terrace divides
Parent material: Loess and loamy and sandy outwash
Slope: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Ridgway silt loam, 2 to 5 percent slopes, eroded, rarely flooded, 1,267 feet east and 1,874 feet north of the southwest corner of sec. 36, T. 1 N., R. 4 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; neutral; abrupt smooth boundary.
Bt1—8 to 16 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate very fine subangular blocky structure; firm; many faint brown (10YR 4/3) clay films on faces of peds; neutral; clear smooth boundary.
Bt2—16 to 27 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; firm; many distinct brown (10YR 4/3) clay films on faces of peds; moderately acid; gradual smooth boundary.
2Bt3—27 to 32 inches; brown (7.5YR 4/4) clay loam; moderate coarse subangular blocky structure; firm; common distinct brown (10YR 4/3) clay films on faces of peds; about 35 percent sand; strongly acid; clear smooth boundary.
2Bt4—32 to 52 inches; brown (7.5YR 4/4) sandy loam; weak coarse subangular blocky structure; very firm; few distinct brown (10YR 4/3) clay films on faces of peds; strongly acid; gradual smooth boundary.
2C—52 to 60 inches; dark yellowish brown (10YR 4/4) loamy sand; single grain; loose; strongly acid.

Range in Characteristics

Thickness of the loess: 24 to 40 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3

Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 5
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—7.5YR or 10YR
Value—4 or 5
Chroma—3 to 5
Texture—loam, clay loam, or sandy loam

2C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—sandy loam or loamy sand

Virden Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Typic Argiaquolls

Typical Pedon

Virden silt loam, 500 feet west and 550 feet north of the southeast corner of sec. 16, T. 1 N., R. 5 W.

Ap—0 to 7 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine granular structure; friable; common very fine roots; slightly acid; clear smooth boundary.
A—7 to 14 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; few fine prominent dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure parting to strong fine granular; friable; few very fine roots; slightly acid; clear smooth boundary.
AB—14 to 19 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/8) and few fine distinct light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; firm; few very fine roots; many distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg1—19 to 24 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/6) mottles; weak fine prismatic structure; firm; few very fine roots; common distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—24 to 28 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate fine prismatic structure parting to moderate medium subangular blocky; firm; common distinct very dark gray (10YR 3/1) and gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg3—28 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to strong medium subangular blocky; firm; common distinct very dark gray (10YR 3/1) and gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; neutral; clear smooth boundary.

BCg—35 to 44 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium distinct light olive brown (2.5Y 5/6) mottles; weak coarse prismatic structure; firm; common distinct very dark gray (10YR 3/1) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; slightly alkaline; clear smooth boundary.

Cg1—44 to 57 inches; light brownish gray (2.5Y 6/2) silt loam; many fine and medium distinct light olive brown (2.5Y 5/6) mottles; massive; firm; common fine dark accumulations of iron and manganese oxide; slightly alkaline; clear smooth boundary.

Cg2—57 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine and medium distinct light olive brown (2.5Y 5/6) mottles; massive; firm; few fine dark accumulations of iron and manganese oxide; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches
Thickness of the loess: More than 60 inches

A horizon:
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam

Btg horizon:
Hue—10YR or 2.5Y
Value—3 to 5
Chroma—1 or 2
Texture—silty clay loam or silty clay

BCg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2
Texture—silt loam or silty clay loam

Cg horizon:
Hue—10YR, 2.5Y, or neutral
Value—5 or 6
Chroma—0 to 2
Texture—silt loam or silty clay loam

Wabash Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Flood plains
Landform: Low flood plains
Landform position: Bottoms
Parent material: Alluvium
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Cumulic Haplaquolls

Typical Pedon

Wabash silty clay, frequently flooded, 1,320 feet south and 620 feet east of the northwest corner of sec. 20, T. 1 N., R. 4 W.

Ap—0 to 10 inches; black (10YR 2/1) silty clay, dark gray (10YR 4/1) dry; moderate medium angular blocky structure; friable; many faint very dark gray (10YR 3/1) clay films on faces of peds; many medium dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

A1—10 to 26 inches; very dark gray (N 2/0) silty clay, very dark gray (N 3/0) dry; strong medium prismatic structure parting to strong medium angular blocky; firm; many faint very dark gray (N 2/0) clay films on faces of peds; many medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

A2—26 to 54 inches; very dark gray (N 2/0) silty clay, very dark gray (N 3/0) dry; strong medium prismatic structure parting to strong fine angular blocky; firm; many faint very dark gray (N 2/0) clay films on faces of peds; many medium dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bg—54 to 60 inches; dark gray (5Y 4/1) silty clay; strong medium prismatic structure parting to strong fine angular blocky; firm; many distinct very dark gray (10YR 3/1) clay films on faces of peds; many medium dark accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 36 to more than 60 inches

Ap and A horizons:
Hue—10YR or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam or silty clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—2 or 3
Chroma—0 or 1
Texture—silty clay loam or silty clay

Wagner Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Terraces
Landform: Lake plains
Landform position: Summits
Parent material: Lacustrine sediments
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Mollic Albaqualfs

Typical Pedon

Wagner silt loam, rarely flooded, 600 feet west and 1,000 feet north of the southeast corner of sec. 19, T. 1 N., R. 4 W.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate medium granular structure; friable; slightly acid; abrupt smooth boundary.

Eg1—9 to 13 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium platy structure; firm; common faint very dark grayish brown (10YR 3/2) organic coatings on faces of peds; common fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Eg2—13 to 19 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium platy structure; firm; common fine dark accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Btg—19 to 31 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine dark accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BCg—31 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Cg—41 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; many medium prominent strong brown (7.5YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; massive; firm; common fine dark accumulations of iron and manganese oxide; slightly alkaline.

Range in Characteristics

Thickness of the mollic epipedon: 6 to 10 inches
Thickness of the silty material: 0 to 16 inches

Ap horizon:
Hue—2.5Y or 10YR
Value—2 or 3
Chroma—1 or 2

Btg horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—2.5Y or 10YR
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

Wakeland Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landscape: Flood plains

Landform: High flood plains
Landform position: Bottoms
Parent material: Silty alluvium
Slope: 0 to 2 percent

Taxonomic classification: Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents

Typical Pedon

Wakeland silt loam, frequently flooded, 1,500 feet north and 200 feet east of the southwest corner of sec. 12, T. 3 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium granular structure; friable; neutral; abrupt smooth boundary.

Cg1—7 to 16 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; few fine dark accumulations of iron and manganese oxide; moderately acid; gradual smooth boundary.

Cg2—16 to 55 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; common medium dark accumulations of iron and manganese oxide; moderately acid; gradual smooth boundary.

Cg3—55 to 60 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; common medium dark accumulations of iron and manganese oxide; moderately acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—2 or 3

Cg horizon:
Value—5 or 6
Chroma—1 or 2

Weir Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Typic Ochraqualfs

Typical Pedon

Weir silt loam, 210 feet south and 500 feet east of the northwest of corner of sec. 24, T. 1 N., R. 5 W.

Ap—0 to 9 inches; dark gray (10YR 4/1) silt loam, gray (10YR 6/1) dry; weak very fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

Eg1—9 to 13 inches; light brownish gray (10YR 6/2) silt loam; common fine and medium faint brown (10YR 5/3) mottles; moderate thick platy structure; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; friable; neutral; clear smooth boundary.

Eg2—13 to 18 inches; light brownish gray (10YR 6/2) silt loam; common medium faint brown (10YR 5/3) mottles; moderate thick platy structure parting to weak fine and medium subangular blocky; common faint silt coatings on faces of peds, light gray (10YR 7/1) dry; friable; moderately acid; clear smooth boundary.

BE—18 to 21 inches; light brownish gray (10YR 6/2) silty clay loam; common medium faint brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; few faint silt coatings on faces of peds, light gray (10YR 7/1) dry; friable; few fine and medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—21 to 30 inches; grayish brown (10YR 5/2) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; many faint gray (10YR 5/1) clay films of faces of peds; firm; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—30 to 42 inches; grayish brown (10YR 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; many faint gray (10YR 5/1) clay films on faces of peds; firm; few fine and medium dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

BCg—42 to 52 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; firm; few faint dark gray (10YR 4/1) and gray (10YR 5/1) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; moderately acid; clear smooth boundary.

Cg—52 to 60 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/6) mottles; massive; firm; few fine dark accumulations of iron and manganese oxide; strongly acid.

Range in Characteristics

Thickness of the loess: 60 to 80 inches

Ap horizon:
Value—4 or 5
Chroma—1 or 2

Eg horizon:
Hue—2.5Y or 10YR
Value—5 or 6

Btg horizon:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—1 or 2
Texture—silty clay loam or silty clay

Cg horizon:
Hue—2.5Y or 10YR
Value—4 or 5
Chroma—1 or 2
Texture—silt loam or silty clay loam

Wynoose Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landscape: Uplands
Landform: Till plains
Landform position: Summits
Parent material: Loess and loamy sediments over a paleosol that formed in glacial till
Slope: 0 to 2 percent

Taxonomic classification: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Wynoose silt loam, 1,400 feet north and 400 feet east of the southwest corner of sec. 3, T. 3 N., R. 1 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; few medium dark accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg—8 to 17 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate medium platy structure; friable; few fine dark accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

Btg1—17 to 25 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg2—25 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg3—35 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; common medium dark accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2BCg—41 to 49 inches; light brownish gray (2.5Y 6/2) silt loam; common medium prominent brown (7.5YR 4/4) mottles; weak coarse subangular blocky structure; firm; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine dark accumulations of iron and manganese oxide; about 20 percent sand; strongly acid; gradual smooth boundary.

3Btgb—49 to 60 inches; dark grayish brown (2.5Y 4/2) loam; common medium prominent brown (7.5YR 4/4) mottles; massive; firm; few fine dark accumulations of iron and manganese oxide; about 35 percent sand; moderately acid.

Range in Characteristics

Thickness of the loess: 30 to 55 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—1 or 2

Eg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2

Btg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

2Btg and 2BCg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam

3Btgb horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—loam or clay loam

Formation of the Soils

This section describes the Quaternary geology of Clinton County and relates the five major soil-forming factors to the soils in the county.

Quaternary Geology

All of what is now known as Clinton County was once covered by ice sheets of the Illinoian Glaciation. As these ice sheets retreated, they deposited unconsolidated glacial debris, called glacial drift, and left a relatively flat, featureless landscape broken only by a series of elongated ridges. These landscape features are made up of two types of glacial drift—Vandalia Till and Hagerstown Drift, both of which are members of the Glasford Formation of Illinoian age.

Glacial till covers a more extensive area than the Hagerstown Drift and occupies the basal landscape left by the glacier. The till is unsorted glacial drift transported and deposited by glacial ice. In this county it is dense and loamy and has small pebbles.

Hagerstown Drift is meltwater-sorted sand and gravel deposited in crevices within the ice sheet (Jacobs and Lineback, 1969). This deposit commonly overlies the glacial till plain and occurs as the series of elongated ridges that are common in areas of the county.

Following the Illinoian Glaciation, windblown silt (loess) was deposited over the county, blanketing the glacial drift, especially after the retreat of the Wisconsin glaciers. The primary source of the loess was the flood plain along the Mississippi River (Fehrenbacher and others, 1986). Prevailing westerly winds deposited the loess. The deposit of loess is thickest near the source and gradually thins towards the east. The loess is as much as 12 feet thick in the western part of the county and about 4 feet thick in the eastern part. It includes two predominant stratigraphic units—Peoria Loess and Roxana Silt (Willman and Frye, 1970). Peoria Loess, the uppermost unit, was deposited as a yellowish brown or buff colored silt. Roxana Silt has a higher content of coarse silt particles and is generally darker brown, denser, and less permeable than Peoria Loess.

The county is incised by the Kaskaskia River and its tributaries. During the glacial retreat, meltwater flowed through broad valleys and was responsible for some of the deposits occurring in the valleys. The first depositions, which occurred while the meltwater was flowing rather rapidly, formed the elevated ridges that occur within these valleys. These glaciofluvial deposits are called stream terraces. They are loamy or sandy deposits that were eventually overlain by a mantle of loess. As the Mississippi River swelled from glacial meltwater, the Kaskaskia River backed up and in Clinton County became a lake. When the rapid meltwater entered the still quiet water of this lake, the sands and coarse materials settled out quickly. The finer clays were carried farther in suspension and settled more uniformly over the bottom of this lake area. This deposit is known as a lacustrine terrace and, with some exceptions, occurs at the next lower elevation below the stream terraces. The stream terrace and lacustrine terrace systems are remnants of conditions that existed during the glacial stages and are rarely flooded today.

Below these terrace systems are the present-day flood plains. These are characterized by frequent flooding and continuous deposition of new material carried in by the floodwater.

Factors of Soil Formation

Soil forms through chemical and physical processes that act on deposited or accumulated geologic material. The major factors of soil formation are parent material, climate, plant and animal life, relief, and time (Jenny, 1941). These factors do not act independently but interact together and modify the effects of the others.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It affects the mineralogical and chemical composition of the soil and, to a large extent, determines the rate of soil formation. The soils in Clinton County formed in loess, glacial till, glacial drift, glaciolacustrine material, glaciofluvial deposits, and alluvium.

Most of the soils in the county formed either entirely or partially in loess. In the western half of the county,

the loess deposits are thickest and most of the level or nearly level soils formed entirely in loess. At the time of deposition, the loess was friable and had a high content of weatherable minerals, a high base saturation, and a high available water capacity. Consequently, the soils that formed in this material are high in nutrient reserves and generally have excellent physical properties (Buol and others, 1980). Examples of soils that formed entirely in loess are Harrison, Herrick, and Virden soils. In the eastern half of the county, the deposit of loess is thinner and generally is underlain by glacial till at a depth of 40 to 60 inches. Ava, Bluford, Cisne, Hoyleton, and Wynoose soils are examples of soils that formed in these parent materials.

On the Hagerstown Drift formations, the soils formed in loess and the underlying glacial drift. This drift is more permeable than glacial till and does not restrict the rate of water infiltration to the same extent. The moderately well drained Pike soils are exclusive to these areas.

Certain soils formed almost entirely in glacial till. Atlas and Hickory soils are examples. These soils are on steep side slopes adjacent to drainageways. They generally have a silty surface layer. The glacial till generally is within a depth 20 inches and has numerous small pebbles. In eroded areas the till is exposed.

Some of the soils in the county are affected by sodium. The source of this sodium is feldspars in the loess (Wilding and others, 1963). The sodium weathers out of the sodium-rich feldspars and is redistributed laterally by ground water. It concentrates in certain areas because of variations in the permeability of the underlying glacial till (Wilding and others, 1963). The concentration of sodium is responsible for slick spots in many soils. The sodium levels in these spots can be toxic to plants (Brady, 1974). Darmstadt, Grantfork, Huey, and Piasa soils are affected by sodium.

Alluvial material was transported by water and deposited on flood plains during periods of flooding. The texture of this material varies. The coarser textured material generally occurs near the streams, and finer textured material is farther away from the streams and in slackwater areas. Examples of alluvial soils are Beaucoup, Birds, Petrolia, and Wakeland soils.

Soils that formed in lacustrine material are on terraces above the flood plains. The soils that formed in this clayey material have a high content of clay in the subsoil. They generally are poorly drained or somewhat poorly drained because the high content of clay restricts water movement. Reduced water infiltration in these soils has resulted in little weathering of the subsoil. As a result, many of the soils that formed in this material retain carbonates in the lower part of the subsoil. Examples of these soils are Bartelso, Hurst, Lakaskia, Okaw, and Wagner soils.

Climate

Clinton County has a humid, mid-continental climate. The climate is uniform throughout the county and is not responsible for any differences among the soils within the county. Differences in climate, however, differentiate the soils in this county from the soils in other geographic locations. Two of the most important climate factors affecting soil formation are rainfall and temperature.

Rainfall can influence soil formation through its effects on several processes, the more obvious of which are erosion, plant growth, weathering, and additions of plant nutrients.

Temperature also has a salient influence on soil formation. It affects the type and amount of vegetation and the rate at which organic matter breaks down. The rate of the chemical and physical processes in the soil is governed by temperature. When the soil freezes, chemical processes come to a halt, while the physical processes caused by freezing may still occur. As a soil warms up, the rate of chemical reactions increases.

Plant and Animal Life

Plants, animals, bacteria, and fungi affect soil formation. Two major processes, nutrient cycling and the accumulation of organic matter, are made possible by living organisms. Bacteria and fungi are among the first living organisms to affect soil formation and, as time progresses, are augmented by more complex plant and animal life.

The soil micro-organisms and the larger animals within the soil, such as worms, grubs, and centipedes, are collectively referred to as the soil fauna. The soil fauna affects soil formation by breaking down organic matter and incorporating organic matter into the soil. The soil microfauna is responsible for the decay of organic matter and plays a key role in the formation of a dark surface layer. The larger animals affect soil formation through their digging and burrowing activities. They mix and aerate the soil and incorporate organic matter into the soil. Also, through their excretions and eventually their death, they add nutrients to the soil.

As plants grow and develop, their roots extend downward and laterally through the soil. As they

slough off organic matter, die, and decay, they feed the micro-organisms in the soil. Root penetration also creates micropores and macropores that affect water movement through the soil. The plant material above the ground eventually dies and adds organic matter to the soil surface. This organic matter, in turn, is incorporated into the mineral soil.

The soils in Clinton County formed mainly under a mixture of prairie grasses and the oak-hickory forest type. The accumulation organic matter in the soil is much greater under prairie grasses than under forest vegetation. Harrison, Herrick, and Virden soils are examples of soils that formed under prairie vegetation. They have a thick, dark surface layer. Under forest vegetation a leaf layer establishes itself on the forest floor. The rain infiltrating this litter layer becomes acidic and creates acidic conditions in the mineral soil as it percolates downward. The mineral soil under forest vegetation develops a thin, light colored surface layer and a light colored E horizon above the subsoil. This E horizon has been stripped of nutrients and clay particles through weathering brought on by the acid conditions. Examples of soils that formed under forest vegetation are Ava, Bluford, and Wynoose soils.

Relief

Relief, or lay of the land, affects soil formation through its effect on the degree of slope and on erosion and soil drainage. In areas where parent materials are similar, soils on steep slopes are subject to more erosion than soils in more nearly level areas and generally have a thinner surface layer. This relationship is typified by the contrast between Hickory and Iva soils. Hickory soils are on the steeper slopes along drainageways. Erosion has removed some or all of the loess mantle. As a result, glacial till is at or near the surface. Iva soils, on the other hand, formed on more nearly level, stable landscapes, are little affected by erosion, and have retained their parent material of deep loess.

The drainage class of a soil is determined to a great extent by relief. The soils in depressions are subject to ponding and generally are poorly drained. Newberry soils are an example. On a nearly level landscape, water tends to infiltrate into the soil rather than move over the surface. The nearly level soils generally are poorly drained and have a gray subsoil. This gray color results from the reduction of iron and the removal of iron from the subsoil, which occur under anaerobic conditions. Examples of poorly drained soils are Huey, Piasa, Virden, Weir, and Wynoose soils. As slope increases, the amount of runoff and the hazard of erosion increase and the rate of soil formation decreases. The depth to a seasonal high water table can influence the kind of soil that forms in an area. A water table in a sloping soil generally is at a greater depth than the water table in a nearly level or depressional soil, even though both soils formed in similar kinds of material. Elco, Hickory, and Pike soils formed in the more sloping areas. These soils have a dominantly brown subsoil and a few gray mottles because of more aerobic conditions in the subsoil.

Time

The length of time that the soil material remains in place and is acted on by soil-forming processes affects the degree of soil profile development. Soils in stable landscape positions, where the processes of soil formation have been occurring for a long time, generally have well defined genetic horizons. Cisne soils are examples. Wakeland and other soils on flood plains, which periodically receive new deposits, generally show less evidence of profile development because the processes of soil formation have had much less time to act on the parent material.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Diversion (or diversion terrace). A ridge of earth,

generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Draw. A small stream valley that generally is more open and has broader bottom land than a ravine or gulch.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated

soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to

be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the rate of water infiltration and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition,

or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 5/4 is a color with hue of 10YR, value of 5, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water

or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the

chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner,

and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil generally is silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Moderately sloping	5 to 10 percent
Strongly sloping	10 to 15 percent
Steep	15 to 30 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to Ca^{++} + Mg^{++}. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates

longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1962-89 at Carlyle, Illinois)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	35.6	17.0	26.3	67	-14	3	1.70	0.61	2.61	4	4.1
February----	40.3	21.2	30.8	70	-6	6	2.25	1.18	3.19	4	2.8
March-------	52.7	33.1	42.9	80	10	57	3.88	2.05	5.49	7	2.3
April-------	65.3	44.7	55.0	86	26	208	3.74	2.03	5.24	7	.4
May---------	74.8	53.8	64.3	91	35	450	3.57	2.22	4.79	6	.0
June--------	83.9	62.9	73.4	96	46	705	3.93	1.92	5.67	6	.0
July--------	88.1	67.1	77.6	100	52	848	3.52	1.54	5.20	5	.0
August------	86.0	64.4	75.2	100	42	768	2.71	1.41	3.84	4	.0
September---	79.1	59.9	68.0	95	39	543	3.16	1.23	4.78	4	.0
October-----	67.8	44.8	56.3	88	27	238	2.96	1.37	4.32	5	.0
November----	54.4	35.4	44.9	78	14	63	3.55	1.37	5.39	5	1.0
December----	41.8	24.3	33.0	69	-3	9	3.14	1.43	4.61	5	2.7
Yearly:											
Average---	64.2	43.8	54.0	---	---	---	---	---	---	---	---
Extreme---	104	-20	---	101	-12	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,898	38.12	27.17	45.22	62	13.3

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1962-89 at Carlyle, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 4	April 13	April 27
2 years in 10 later than--	March 30	April 8	April 22
5 years in 10 later than--	March 20	March 29	April 12
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 3	Oct. 19	Oct. 8
2 years in 10 earlier than--	Nov. 8	Oct. 25	Oct. 13
5 years in 10 earlier than--	Nov. 17	Nov. 4	Oct. 23

Table 3.--Growing Season

(Recorded in the period 1962-89 at Carlyle, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	221	198	172
8 years in 10	228	205	179
5 years in 10	241	220	193
2 years in 10	254	234	207
1 year in 10	261	242	214

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2	Cisne silt loam	6,900	2.1
3A	Hoyleton silt loam, 0 to 2 percent slopes	5,570	1.7
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded	2,305	0.7
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	6,505	2.0
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded	5,945	1.8
5D3	Blair silty clay loam, 10 to 15 percent slopes, severely eroded	1,810	0.6
7C3	Atlas clay loam, 5 to 10 percent slopes, severely eroded	520	0.2
8D2	Hickory loam, 10 to 15 percent slopes, eroded	1,250	0.4
8D3	Hickory clay loam, 10 to 15 percent slopes, severely eroded	1,355	0.4
8F	Hickory loam, 15 to 30 percent slopes	3,335	1.0
12	Wynoose silt loam	2,540	0.8
13A	Bluford silt loam, 0 to 2 percent slopes	6,695	2.1
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	5,360	1.7
14B	Ava silt loam, 2 to 5 percent slopes	1,435	0.4
46A	Herrick silt loam, 0 to 2 percent slopes	8,715	2.7
50	Virden silt loam	1,935	0.6
53D	Bloomfield fine sand, 10 to 15 percent slopes	115	*
112	Cowden silt loam	11,030	3.4
113A	Oconee silt loam, 0 to 2 percent slopes	7,720	2.4
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded	3,025	0.9
119D3	Elco silty clay loam, 10 to 15 percent slopes, severely eroded	850	0.3
127B	Harrison silt loam, 2 to 5 percent slopes	1,540	0.5
165	Weir silt loam	3,055	0.9
218	Newberry silt loam	2,765	0.9
453B2	Muren silt loam, 2 to 5 percent slopes, eroded	8,375	2.6
454	Iva silt loam	7,980	2.5
533	Urban land	135	*
583B2	Pike silt loam, 2 to 5 percent slopes, eroded	2,075	0.6
583C2	Pike silt loam, 5 to 10 percent slopes, eroded	1,725	0.5
583C3	Pike silty clay loam, 5 to 10 percent slopes, severely eroded	1,715	0.5
801	Orthents, silty, undulating	2,120	0.7
912A	Hoyleton-Darmstadt complex, 0 to 2 percent slopes	28,285	8.8
912B2	Hoyleton-Darmstadt complex, 2 to 5 percent slopes, eroded	14,080	4.4
916A	Oconee-Darmstadt complex, 0 to 2 percent slopes	15,425	4.8
916B2	Oconee-Darmstadt complex, 2 to 5 percent slopes, eroded	10,095	3.1
934B2	Blair-Grantfork complex, 2 to 5 percent slopes, eroded	555	0.2
934C2	Blair-Grantfork complex, 5 to 10 percent slopes, eroded	5,285	1.6
941	Virden-Piasa complex	10,680	3.3
991	Cisne-Huey complex	18,905	5.9
993	Cowden-Piasa complex	6,630	2.1
2002	Cisne-Urban land complex	300	0.1
2912A	Hoyleton-Darmstadt-Urban land complex, 0 to 2 percent slopes	205	0.1
3070	Beaucoup silt loam, frequently flooded	9,390	2.9
3083	Wabash silty clay, frequently flooded	735	0.2
3131A	Alvin silt loam, 0 to 2 percent slopes, frequently flooded	810	0.3
3288	Petrolia silty clay loam, frequently flooded	6,455	2.0
3304A	Landes fine sandy loam, 0 to 2 percent slopes, frequently flooded	595	0.2
3333	Wakeland silt loam, frequently flooded	18,100	5.6
3334	Birds silt loam, frequently flooded	16,895	5.2
3402	Colo silt loam, frequently flooded	605	0.2
3603	Blackoar silt loam, frequently flooded	5,135	1.6
7026	Wagner silt loam, rarely flooded	2,590	0.8
7084	Okaw silt loam, rarely flooded	1,295	0.4
7338A	Hurst silt loam, 0 to 2 percent slopes, rarely flooded	1,170	0.4
7338B	Hurst silt loam, 2 to 5 percent slopes, eroded, rarely flooded	535	0.2
7434B	Ridgway silt loam, 2 to 5 percent slopes, eroded, rarely flooded	1,380	0.4
7436B	Meadowbank silt loam, 2 to 5 percent slopes, rarely flooded	500	0.2
7466	Bartelso silt loam, rarely flooded	1,880	0.6
7468	Lakaskia silt loam, rarely flooded	2,155	0.7

* See footnote at end of table

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
8109	Racoon silt loam, occasionally flooded	3,810	1.2
8432A	Geff silt loam, 0 to 2 percent slopes, occasionally flooded	1,230	0.4
	Water	20,000	6.2
	Total	322,110	100.0

* Less than 0.1 percent.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil.)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
2------Cisne	IIIw	115	35	52	4.5	---
3A------Hoyleton	IIw	116	34	53	4.7	7.5
3B2------Hoyleton	IIe	111	33	51	4.5	7.2
5C2------Blair	IIIe	89	31	41	3.5	5.8
5C3------Blair	IVe	82	29	38	3.2	5.4
5D3------Blair	VIe	---	---	---	3.1	5.1
7C3------Atlas	IVe	---	---	16	---	---
8D2------Hickory	IIIe	72	23	28	2.7	4.5
8D3------Hickory	IVe	65	20	25	2.5	4.1
8F------Hickory	VIe	---	---	---	---	3.8
12------Wynoose	IIIw	96	33	46	---	---
13A------Bluford	IIw	103	33	49	4.1	---
13B2------Bluford	IIe	99	32	47	3.9	---
14B------Ava	IIe	97	33	48	4.3	---
46A------Herrick	IIw	141	45	61	5.5	9.2
50------Virden	IIw	144	46	60	---	---
53D------Bloomfield	IVe	73	29	38	2.9	4.8
112------Cowden	IIw	120	37	53	---	---

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
113A----------- Oconee	IIw	120	36	54	5.0	---
113B2---------- Oconee	IIe	118	35	52	4.9	---
119D3---------- Elco	IVe	93	---	39	3.7	6.1
127B----------- Harrison	IIe	135	42	58	---	8.4
165------------ Weir	IIIw	103	34	45	---	---
218------------ Newberry	IIw	118	37	53	---	---
453B2---------- Muren	IIe	120	42	48	---	---
454------------ Iva	IIw	137	40	55	4.4	---
533. Urban land						
583B2---------- Pike	IIe	115	40	46	3.8	---
583C2---------- Pike	IIIe	105	37	42	3.4	---
583C3---------- Pike	IVe	100	35	40	3.3	---
801. Orthents						
912A-----------		93	30	45	3.9	6.4
Hoyleton-------	IIw					
Darmstadt------	IIIw					
912B2----------		90	28	43	3.7	6.0
Hoyleton-------	IIe					
Darmstadt------	IIIe					
916A-----------		96	31	46	4.1	---
Oconee---------	IIw					
Darmstadt------	IIIw					
916B2----------		94	30	44	3.9	---
Oconee---------	IIe					
Darmstadt------	IIIe					
934B2----------		70	27	35	3.1	4.8
Blair----------	IIe					
Grantfork------	IIIe					

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
934C2		67	25	34	3.0	4.7
Blair	IIIe					
Grantfork	IVe					
941		112	37	49	---	---
Virden	IIw					
Piasa	IIIw					
991		91	30	44	3.6	---
Cisne	IIIw					
Huey	IVw					
993		100	33	45	---	---
Cowden	IIw					
Piasa	IIIw					
2002. Cisne-Urban land						
2912A. Hoyleton-Darmstadt-Urban land						
3070 Beaucoup	IIIw	117	39	47	---	---
3083 Wabash	IIIw	80	25	32	---	---
3131A Alvin	IIs	93	31	---	4.1	6.8
3288 Petrolia	IIIw	110	35	40	---	---
3304A Landes	IIIw	67	23	---	---	4.1
3333 Wakeland	IIw	125	44	50	---	---
3334 Birds	IIIw	111	38	47	---	---
3402 Colo	IIIw	120	40	---	---	---
3603 Blackoar	IIIw	85	32	36	3.8	---
7026 Wagner	IIw	106	35	49	---	---
7084 Okaw	IIIw	84	28	41	---	---

See footnote at end of table.

Table 5.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Orchardgrass-alfalfa hay	Bromegrass-alfalfa
		Bu	Bu	Bu	Tons	AUM*
7338A----------- Hurst	IIIw	87	32	45	---	---
7338B----------- Hurst	IIIe	82	30	42	---	---
7434B----------- Ridgway	IIe	118	40	49	4.9	8.2
7436B----------- Meadowbank	IIe	143	44	59	5.4	8.9
7466------------ Bartelso	IIw	143	47	62	5.5	9.2
7468------------ Lakaskia	IIIw	115	39	47	---	---
8109------------ Racoon	IIw	103	33	46	---	---
8432A----------- Geff	IIw	109	33	37	4.8	7.8

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 6.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name.)

Map symbol	Soil name
2	Cisne silt loam (where drained)
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
13A	Bluford silt loam, 0 to 2 percent slopes (where drained)
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
46A	Herrick silt loam, 0 to 2 percent slopes
50	Virden silt loam (where drained)
112	Cowden silt loam (where drained)
113A	Oconee silt loam, 0 to 2 percent slopes (where drained)
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded
127B	Harrison silt loam, 2 to 5 percent slopes
453B2	Muren silt loam, 2 to 5 percent slopes, eroded
454	Iva silt loam (where drained)
3070	Beaucoup silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3131A	Alvin silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3334	Birds silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
7026	Wagner silt loam, rarely flooded (where drained)
7434B	Ridgway silt loam, 2 to 5 percent slopes, eroded, rarely flooded
7436B	Meadowbank silt loam, 2 to 5 percent slopes, rarely flooded
7466	Bartelso silt loam, rarely flooded (where drained)
7468	Lakaskia silt loam, rarely flooded (where drained)
8109	Racoon silt loam, occasionally flooded (where drained)
8432A	Geff silt loam, 0 to 2 percent slopes, occasionally flooded (where drained)

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available.)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to plant
								m^3/ha	
2 Cisne	4W	Slight	Severe	Moderate	Moderate	Pin oak	70	4	Pin oak, green ash, water tupelo, red maple.
						White oak	---	---	
						Black oak	---	---	
						Bitternut hickory	---	---	
3A, 3B2 Hoyleton	4A	Slight	Slight	Slight	Slight	White oak	70	4	Shortleaf pine, white oak, eastern white pine, eastern cottonwood, northern red oak, green ash.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	---	---	
5C2, 5C3, 5D3 Blair	4A	Slight	Slight	Slight	Slight	White oak	70	4	Shortleaf pine, loblolly pine, eastern white pine.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	70	4	
7C3 Atlas	4C	Slight	Slight	Moderate	Moderate	White oak	70	4	Green ash, pin oak, red maple, Austrian pine.
						Northern red oak	70	4	
						Bur oak	70	4	
						Green ash	---	---	
8D2, 8D3 Hickory	5A	Slight	Slight	Slight	Slight	White oak	85	5	White oak, yellow-poplar, black walnut, sugar maple, eastern white pine.
						Northern red oak	85	5	
						Black oak	---	---	
						Yellow-poplar	95	7	
						Green ash	---	---	
8F Hickory	5R	Moderate	Moderate	Slight	Slight	White oak	85	5	White oak, yellow-poplar, black walnut, sugar maple, eastern white pine.
						Northern red oak	85	5	
						Black oak	---	---	
						Yellow-poplar	95	7	
						Green ash	---	---	
12 Wynoose	4W	Slight	Severe	Moderate	Moderate	Pin oak	70	4	Pin oak, red maple.
						White oak	---	---	
						Black oak	---	---	
13A, 13B2 Bluford	4A	Slight	Slight	Slight	Slight	White oak	70	4	Shortleaf pine, loblolly pine, eastern white pine, eastern redcedar.
						Northern red oak	70	4	
						Southern red oak	70	4	
						Green ash	---	---	
						Bur oak	---	---	

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi- nation symbol	Management concerns: Erosion hazard	Management concerns: Equip- ment limita- tion	Management concerns: Seedling mortal- ity	Management concerns: Wind- throw hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to plant
								m^3/ha	
14B------------- Ava	4A	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Yellow-poplar------- Black walnut--------	75 80 90 ---	4 4 6 ---	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white oak, American sycamore.
53D------------- Bloomfield	4S	Slight	Slight	Moderate	Slight	Black oak----------- White oak----------- Scarlet oak--------- Shagbark hickory----	70 --- --- ---	4 --- --- ---	Eastern white pine, Scotch pine, red pine, eastern redcedar, jack pine.
119D3----------- Elco	4A	Slight	Slight	Slight	Slight	White oak----------- Northern red oak---- Black walnut--------	80 --- ---	4 --- ---	White oak, northern red oak, black walnut, green ash, eastern white pine, white ash.
165------------- Weir	4W	Slight	Moderate	Moderate	Slight	Pin oak------------- White oak----------- Black oak----------- Pignut hickory------	70 --- --- ---	4 --- --- ---	Baldcypress, pin oak, water tupelo, red maple.
453B2----------- Muren	5A	Slight	Slight	Slight	Slight	White oak----------- Yellow-poplar------- Sweetgum------------	90 98 76	5 7 5	Eastern white pine, red pine, black walnut, black locust, yellow-poplar, white ash.
454------------- Iva	4W	Slight	Moderate	Slight	Slight	White oak----------- Pin oak------------- Yellow-poplar------- Sweetgum------------	75 85 85 80	4 5 6 6	Eastern white pine, baldcypress, white ash, red maple, yellow-poplar, American sycamore.
583B2, 583C2, 583C3---------- Pike	5A	Slight	Slight	Slight	Slight	White oak----------- Yellow-poplar------- Sweetgum------------	90 98 76	5 7 5	Eastern white pine, red pine, black walnut, black locust, yellow-poplar, white ash.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to plant
								m³/ha	
912A, 912B2:									
Hoyleton-------	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	Shortleaf pine, white oak, eastern white pine, eastern cottonwood, northern red oak, green ash.
						Northern red oak----	70	4	
						Green ash-----------	---	---	
						Bur oak-------------	---	---	
Darmstadt------	4T	Slight	Slight	Moderate	Slight	White oak-----------	70	4	Eastern white pine, white oak, green ash, eastern redcedar, Osage-orange.
						Black oak-----------	70	4	
						Pignut hickory------	---	---	
916A, 916B2:									
Oconee.									
Darmstadt------	4T	Slight	Slight	Moderate	Slight	White oak-----------	70	4	Eastern white pine, white oak, green ash, eastern redcedar, Osage-orange.
						Black oak-----------	70	4	
						Pignut hickory------	---	---	
934B2, 934C2:									
Blair---------	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	Shortleaf pine, loblolly pine, eastern white pine.
						Northern red oak----	70	4	
						Green ash-----------	---	---	
						Bur oak-------------	70	4	
Grantfork-----	4T	Slight	Slight	Slight	Slight	Black oak-----------	70	4	Eastern redcedar, eastern white pine, green ash, white ash.
						Post oak------------	---	---	
						Shagbark hickory----	---	---	
991:									
Cisne----------	4W	Slight	Severe	Moderate	Moderate	Pin oak-------------	70	4	Pin oak, green ash, water tupelo, red maple.
						White oak-----------	---	---	
						Black oak-----------	---	---	
						Bitternut hickory---	---	---	
Huey-----------	3T	Slight	Severe	Severe	Moderate	Green ash-----------	60	3	Eastern redcedar, eastern white pine, green ash, Osage-orange.
						Eastern cottonwood--	---	---	
						White oak-----------	---	---	

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to plant
								m^3/ha	
2002:									
Cisne----------	4W	Slight	Severe	Moderate	Moderate	Pin oak-------------	70	4	Pin oak, green ash, water tupelo, red maple.
						White oak-----------	---	---	
						Black oak-----------	---	---	
						Bitternut hickory---	---	---	
Urban land.									
2912A:									
Hoyleton-------	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	Shortleaf pine, white oak, eastern white pine, eastern cottonwood, northern red oak, green ash.
						Northern red oak----	70	4	
						Green ash-----------	---	---	
						Bur oak-------------	---	---	
Darmstadt------	4T	Slight	Slight	Moderate	Slight	White oak-----------	70	4	Eastern white pine, white oak, green ash, eastern redcedar, Osage-orange.
						Black oak-----------	70	4	
						Pignut hickory------	---	---	
Urban land.									
3070------------ Beaucoup	5W	Slight	Severe	Moderate	Moderate	Pin oak-------------	90	5	Eastern cottonwood, red maple, American sycamore, sweetgum, pin oak.
						Eastern cottonwood--	100	9	
						Sweetgum------------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	
3131A----------- Alvin	4A	Slight	Slight	Slight	Slight	White oak-----------	80	4	White oak, green ash, yellow-poplar, black walnut, eastern white pine, sugar maple.
						Northern red oak----	80	4	
						Yellow-poplar-------	90	6	
						Black walnut--------	---	---	
3288------------ Petrolia	5W	Slight	Moderate	Moderate	Slight	Pin oak-------------	90	5	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
						Eastern cottonwood--	100	9	
						Sweetgum------------	---	---	
						Cherrybark oak------	---	---	
						American sycamore---	---	---	

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to plant
								m^3/ha	
3304A----------- Landes	7A	Slight	Slight	Slight	Slight	Yellow-poplar------- Eastern cottonwood-- American sycamore--- Sweetgum------------ Green ash-----------	95 105 --- --- ---	7 10 --- --- ---	Yellow-poplar, eastern cottonwood, American sycamore, sweetgum, green ash, black walnut, eastern white pine, sugar maple.
3333------------ Wakeland	5A	Slight	Slight	Slight	Slight	Pin oak------------- Sweetgum------------ Yellow-poplar------- Virginia pine-------	90 88 90 85	5 7 6 9	Eastern white pine, baldcypress, American sycamore, red maple, white ash.
3334------------ Birds	5W	Slight	Severe	Moderate	Moderate	Pin oak------------- Eastern cottonwood-- Sweetgum------------ Cherrybark oak------ American sycamore---	90 100 --- --- ---	5 9 --- --- ---	Eastern cottonwood, red maple, American sycamore, baldcypress, water tupelo.
3603------------ Blackoar	4W	Slight	Severe	Moderate	Moderate	Pin oak------------- Eastern cottonwood-- Green ash-----------	80 95 ---	4 8 ---	Pin oak, eastern cottonwood, pecan.
7026------------ Wagner	4W	Slight	Severe	Severe	Severe	Pin oak------------- Blackjack oak------- Black oak-----------	70 60 55	4 3 3	Pin oak, baldcypress, water tupelo, red maple, swamp white oak.
7084------------ Okaw	4W	Slight	Severe	Severe	Severe	Pin oak------------- Blackjack oak------- Black oak----------- White oak-----------	70 60 55 ---	4 3 3 ---	Pin oak, baldcypress, green ash, water tupelo, red maple, swamp white oak.
7338A, 7338B---- Hurst	4C	Slight	Slight	Moderate	Moderate	White oak----------- Southern red oak---- White ash----------- Bur oak-------------	70 70 --- ---	4 4 --- ---	Austrian pine, green ash, pin oak, eastern redcedar, red maple, shortleaf pine, baldcypress.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume of wood fiber	Trees to plant
								m^3/ha	
7434B----------- Ridgway	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	7	Yellow-poplar, white oak, green ash, black walnut, eastern white pine.
						White oak-----------	85	5	
						Sweetgum------------	80	6	
						Green ash-----------	76	3	
7466------------ Bartelso	---	---	---	---	---	---	---	---	Eastern white pine, white oak, northern red oak, green ash.
8109------------ Racoon	4W	Slight	Severe	Moderate	Severe	Pin oak-------------	80	4	Baldcypress, pin oak, water tupelo, red maple.
						Post oak------------	80	4	
						Green ash-----------	---	---	
						White oak-----------	---	---	
8432A----------- Geff	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	White oak, green ash, yellow-poplar, sugar maple, sweetgum.
						Northern red oak----	70	4	
						Green ash-----------	---	---	
						Bur oak-------------	---	---	

Table 8.--Windbreaks and Environmental Plantings

(The symbol > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil.)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
2. Cisne	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3A, 3B2. Hoyleton	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
5C2, 5C3, 5D3. Blair	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
7C3. Atlas	American cranberrybush, silky dogwood, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Osage-orange, green ash, Austrian pine.	Pin oak, eastern white pine.	---
8D2, 8D3, 8F. Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
12. Wynoose	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
13A, 13B2. Bluford	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
14B. Ava	Washington hawthorn, Amur privet, eastern redcedar, silky dogwood, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
46A Herrick	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
50 Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
53D Bloomfield	Radiant crabapple, eastern redcedar, autumn olive, Washington hawthorn, Amur honeysuckle, lilac.	Austrian pine, jack pine, red pine.	Eastern white pine	---
112 Cowden	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, blue spruce, Norway spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
113A, 113B2 Oconee	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange, northern whitecedar.	Eastern white pine, pin oak.	---
119D3 Elco	Silky dogwood, honeysuckle, Amur privet, American cranberrybush.	Northern whitecedar, Washington hawthorn, blue spruce, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
127B Harrison	American cranberrybush, Amur honeysuckle, autumn olive, silky dogwood.	Blue spruce, northern whitecedar, Washington hawthorn, white fir.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
165 Weir	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
218 Newberry	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
453B2 Muren	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
454 Iva	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
533. Urban land				
583B2, 583C2, 583C3 Pike	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, northern whitecedar, blue spruce, white fir.	Austrian pine, Norway spruce.	Pin oak, eastern white pine.
801. Orthents				
912A, 912B2:				
Hoyleton	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
916A, 916B2:				
Oconee	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange, northern whitecedar.	Eastern white pine, pin oak.	---
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
934B2, 934C2:				
Blair	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Grantfork	Eastern redcedar, Russian-olive.	Green ash, Siberian elm.	---	---
941:				
Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
991:				
Cisne	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Huey	Eastern redcedar, Russian-olive, silky dogwood.	Siberian elm, green ash.	---	---
993:				
Cowden	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, northern whitecedar, blue spruce, Norway spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
2002:				
Cisne	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
Urban land.				
2912A:				
Hoyleton	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Urban land.				
3070 Beaucoup	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
3083 Wabash	Silky dogwood, Amur honeysuckle, American cranberrybush, Amur privet.	Norway spruce, northern whitecedar, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
3131A------------- Alvin	Amur privet, Washington hawthorn, Amur honeysuckle, silky dogwood.	Austrian pine, northern whitecedar, Osage-orange, eastern redcedar, American cranberrybush.	Eastern white pine, red pine, Norway spruce.	---
3288-------------- Petrolia	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	White fir, blue spruce, Washington hawthorn, Norway spruce, Austrian pine, northern whitecedar.	Eastern white pine----	Pin oak.
3304A------------- Landes	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
3333-------------- Wakeland	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Northern whitecedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
3334-------------- Birds	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, white fir, blue spruce, northern whitecedar, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
3402-------------- Colo	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, white fir, northern whitecedar, Washington hawthorn.	Eastern white pine----	Pin oak.
3603-------------- Blackoar	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
7026-------------- Wagner	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.
7084-------------- Okaw	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, northern whitecedar, blue spruce, white fir, Washington hawthorn.	Eastern white pine----	Pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of--			
	8-15	16-25	26-35	>35
7338A, 7338B: Hurst	Washington hawthorn, Amur privet, arrowwood, silky dogwood, Amur honeysuckle, eastern redcedar, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
7434B: Ridgway	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
7436B: Meadowbank	Amur honeysuckle, Amur privet, silky dogwood, American cranberrybush.	White fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
7466: Bartelso	Amur honeysuckle, silky dogwood, American cranberrybush, Amur privet.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce.	Eastern white pine, pin oak.
7468. Lakaskia				
8109. Racoon				
8432A: Geff	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce.	Eastern white pine, pin oak.

Table 9.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2----------- Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
3A, 3B2----------- Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
5C2, 5C3----------- Blair	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
5D3----------- Blair	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
7C3----------- Atlas	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness, droughty.
8D2, 8D3----------- Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8F----------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
12----------- Wynoose	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
13A, 13B2----------- Bluford	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
14B----------- Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
46A----------- Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
50----------- Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53D----------- Bloomfield	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope.
112----------- Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
113A, 113B2----------- Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
119D3: Elco	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
127B: Harrison	Slight	Slight	Moderate: slope.	Slight	Slight.
165: Weir	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
218: Newberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
453B2: Muren	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: erodes easily.	Slight.
454: Iva	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
533. Urban land					
583B2: Pike	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
583C2, 583C3: Pike	Slight	Slight	Severe: slope.	Severe: erodes easily.	Slight.
801: Orthents	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope.	Slight	Slight.
912A, 912B2:					
Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
916A, 916B2:					
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
934B2:					
Blair	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
Grantfork	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
934C2:					
Blair	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
Grantfork	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
941:					
Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
991:					
Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
993:					
Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
2002:					
Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
Urban land.					
2912A:					
Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
2912A:					
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
Urban land.					
3070 Beaucoup	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3083 Wabash	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
3131A Alvin	Severe: flooding.	Moderate: flooding.	Slight	Severe: erodes easily.	Severe: flooding.
3288 Petrolia	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3304A Landes	Severe: flooding.	Moderate: flooding.	Slight	Moderate: flooding.	Severe: flooding.
3333 Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3334 Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3402 Colo	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3603 Blackoar	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
7026 Wagner	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
7084 Okaw	Severe: flooding, ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
7338A, 7338B Hurst	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
7434B Ridgway	Severe: flooding.	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
7436B Meadowbank	Severe: flooding.	Slight	Moderate: slope.	Slight	Slight.
7466 Bartelso	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
7468 Lakaskia	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8109 Racoon	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
8432A------------------ Geff	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.

Table 10.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated.)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2 Cisne	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
3A Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3B2 Hoyleton	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
5C2, 5C3, 5D3 Blair	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7C3 Atlas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8D2, 8D3, 8F Hickory	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
12 Wynoose	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
13A Bluford	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
13B2 Bluford	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
14B Ava	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
46A Herrick	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
50 Virden	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
53D Bloomfield	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
112 Cowden	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
113A Oconee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
113B2 Oconee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
119D3 Elco	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
127B Harrison	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
165 Weir	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hardwood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
218----------------- Newberry	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
453B2-------------- Muren	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
454---------------- Iva	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
533. Urban land										
583B2-------------- Pike	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
583C2, 583C3------- Pike	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
801. Orthents										
912A:										
Hoyleton----------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Darmstadt---------	Fair	Good	Poor	Good	Good	Fair	Fair	Fair	Good	Fair.
912B2:										
Hoyleton----------	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Darmstadt---------	Fair	Good	Poor	Good	Good	Fair	Poor	Fair	Good	Poor.
916A:										
Oconee------------	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Darmstadt---------	Fair	Good	Poor	Good	Good	Fair	Fair	Fair	Good	Fair.
916B2:										
Oconee------------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Darmstadt---------	Fair	Good	Poor	Good	Good	Fair	Poor	Fair	Good	Poor.
934B2, 934C2:										
Blair-------------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Grantfork---------	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
941:										
Virden------------	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Piasa-------------	Poor	Fair	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
991:										
Cisne-------------	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Huey--------------	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
993:										
Cowden	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Piasa	Poor	Fair	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
2002:										
Cisne	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Urban land.										
2912A:										
Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Darmstadt	Fair	Good	Poor	Good	Good	Fair	Fair	Fair	Good	Fair.
Urban land.										
3070 Beaucoup	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3083 Wabash	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good.
3131A Alvin	Good	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3288 Petrolia	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3304A Landes	Poor	Fair	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
3333 Wakeland	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
3334 Birds	Good	Fair	Good	Good	Fair	Good	Good	Good	Good	Good.
3402 Colo	Good	Fair	Good	Fair	Poor	Good	Good	Fair	Fair	Good.
3603 Blackoar	Good	Good	Good	Fair	Fair	Good	Fair	Good	Fair	Fair.
7026 Wagner	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Fair.
7084 Okaw	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
7338A Hurst	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair.
7338B Hurst	Fair	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.
7434B Ridgway	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
7436B---------------- Meadowbank	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
7466---------------- Bartelso	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
7468---------------- Lakaskia	Poor	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
8109---------------- Racoon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
8432A---------------- Geff	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

Table 11.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2----------------- Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
3A, 3B2----------- Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
5C2, 5C3---------- Blair	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness.
5D3--------------- Blair	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
7C3--------------- Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness, droughty.
8D2, 8D3---------- Hickory	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8F---------------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
12---------------- Wynoose	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
13A, 13B2--------- Bluford	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
14B--------------- Ava	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Moderate: wetness.
46A--------------- Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
50---------------- Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
53D: Bloomfield	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
112: Cowden	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
113A, 113B2: Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
119D3: Elco	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
127B: Harrison	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
165: Weir	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
218: Newberry	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
453B2: Muren	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
454: Iva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
533. Urban land						
583B2: Pike	Slight	Slight	Slight	Slight	Severe: low strength, frost action.	Slight.
583C2, 583C3: Pike	Slight	Slight	Slight	Moderate: slope.	Severe: low strength, frost action.	Slight.
801: Orthents	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.	Slight.
912A, 912B2: Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
912A, 912B2:						
Darmstadt--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
916A, 916B2:						
Oconee-----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
Darmstadt--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
934B2:						
Blair------------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Moderate: wetness.
Grantfork--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
934C2:						
Blair------------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness.
Grantfork--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
941:						
Virden-----------	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
Piasa------------	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
991:						
Cisne------------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Huey-------------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
993:						
Cowden-----------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
993:						
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
2002:						
Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
Urban land.						
2912A:						
Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
Urban land.						
3070 Beaucoup	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3083 Wabash	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, flooding.
3131A Alvin	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3288 Petrolia	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3304A Landes	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
3333 Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
3334 Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3402 Colo	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
3603 Blackoar	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
7026 Wagner	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
7084 Okaw	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
7338A, 7338B Hurst	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
7434B Ridgway	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, frost action.	Slight.
7436B Meadowbank	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, frost action.	Slight.
7466 Bartelso	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
7468 Lakaskia	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
8109 Racoon	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.
8432A Geff	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.

Table 12.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2 Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
3A Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
3B2 Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
5C2, 5C3 Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
5D3 Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, slope, wetness.
7C3 Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
8D2, 8D3 Hickory	Moderate: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope.
8F Hickory	Severe: slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Poor: slope.
12 Wynoose	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
13A Bluford	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
13B2 Bluford	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
14B Ava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
46A Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
50 Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
53D Bloomfield	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
112 Cowden	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113A Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113B2 Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
119D3 Elco	Severe: wetness, percs slowly.	Severe: slope, wetness.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
127B Harrison	Severe: wetness.	Severe: wetness.	Moderate: wetness, too clayey.	Slight	Fair: too clayey, wetness.
165 Weir	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
218 Newberry	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: hard to pack, wetness.
453B2 Muren	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
454 Iva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
533. Urban land					
583B2 Pike	Slight	Moderate: seepage, slope.	Severe: seepage.	Slight	Fair: too clayey.
583C2, 583C3 Pike	Slight	Severe: slope.	Severe: seepage.	Slight	Fair: too clayey.
801 Orthents	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
912A:					
Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
912B2:					
Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
916A:					
Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
916B2:					
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
934B2:					
Blair	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Grantfork	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
934C2:					
Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Grantfork	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
941:					
Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
991:					
Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Huey	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
993:					
Cowden	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
2002:					
Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Urban land.					
2912A:					
Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Urban land.					
3070 Beaucoup	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3083 Wabash	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
3131A: Alvin	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: thin layer.
3288: Petrolia	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3304A: Landes	Severe: flooding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, too sandy.	Severe: flooding, seepage.	Poor: seepage, too sandy.
3333: Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3334: Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3402: Colo	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
3603: Blackoar	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
7026: Wagner	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
7084: Okaw	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
7338A: Hurst	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
7338B: Hurst	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
7434B: Ridgway	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey, thin layer.
7436B: Meadowbank	Moderate: flooding.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey, thin layer.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
7466---------------- Bartelso	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
7468---------------- Lakaskia	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
8109---------------- Racoon	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
8432A--------------- Geff	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.

Table 13.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2-------------------- Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
3A, 3B2--------------- Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
5C2, 5C3-------------- Blair	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
5D3------------------- Blair	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
7C3------------------- Atlas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
8D2, 8D3-------------- Hickory	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
8F-------------------- Hickory	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
12-------------------- Wynoose	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
13A, 13B2------------- Bluford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
14B------------------- Ava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
46A------------------- Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
50-------------------- Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
53D------------------- Bloomfield	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
112------------------- Cowden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
113A, 113B2----------- Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
119D3----------------- Elco	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
127B------------------ Harrison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
165------------------- Weir	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
218------------------- Newberry	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
453B2----------------- Muren	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
454------------------- Iva	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
533. Urban land				
583B2, 583C2, 583C3--- Pike	Good-----------------	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
801------------------- Orthents	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
912A, 912B2:				
Hoyleton-------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Darmstadt------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
916A, 916B2:				
Oconee---------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Darmstadt------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
934B2, 934C2:				
Blair----------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Grantfork------------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
941:				
Virden---------------	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
941:				
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
991:				
Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, excess sodium.
993:				
Cowden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
2002:				
Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Urban land.				
2912A:				
Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Urban land.				
3070 Beaucoup	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3083 Wabash	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3131A Alvin	Good	Probable	Improbable: too sandy.	Fair: thin layer.
3288 Petrolia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3304A Landes	Good	Probable	Improbable: too sandy.	Fair: too sandy, small stones, thin layer.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
3333------------------ Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3334------------------ Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3402------------------ Colo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
3603------------------ Blackoar	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
7026------------------ Wagner	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
7084------------------ Okaw	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
7338A, 7338B---------- Hurst	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
7434B----------------- Ridgway	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: too clayey, small stones, area reclaim.
7436B----------------- Meadowbank	Good-----------------	Probable-------------	Improbable: too sandy.	Fair: small stones, area reclaim.
7466------------------ Bartelso	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
7468------------------ Lakaskia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
8109------------------ Racoon	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
8432A----------------- Geff	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.

Table 14.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation.)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting- Drainage	Features affecting- Irrigation	Features affecting- Terraces and diversions	Features affecting- Grassed waterways
2 Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3A Hoyleton	Slight	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3B2 Hoyleton	Moderate: slope.	Severe: thin layer, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
5C2, 5C3 Blair	Moderate: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
5D3 Blair	Severe: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
7C3 Atlas	Moderate: slope.	Severe: hard to pack.	Percs slowly, frost action, slope.	Slope, wetness, droughty.	Wetness	Wetness.
8D2, 8D3, 8F Hickory	Severe: slope.	Slight	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
12 Wynoose	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13A Bluford	Slight	Severe: piping.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13B2 Bluford	Moderate: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
14B Ava	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
46A Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
50 Virden	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
53D Bloomfield	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting- Drainage	Irrigation	Terraces and diversions	Grassed waterways
112 Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113A Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113B2 Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
119D3 Elco	Severe: slope.	Moderate: piping, wetness.	Frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily.
127B Harrison	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
165 Weir	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
218 Newberry	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
453B2 Muren	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
454 Iva	Moderate: seepage.	Severe: thin layer, wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
533. Urban land						
583B2, 583C2, 583C3 Pike	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
801 Orthents	Moderate: seepage, slope.	Slight	Deep to water	Slope	Favorable	Favorable.
912A: Hoyleton	Slight	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting- Drainage	Irrigation	Terraces and diversions	Grassed waterways
912B2:						
Hoyleton	Moderate: slope.	Severe: thin layer, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
916A:						
Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
916B2:						
Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
934B2, 934C2:						
Blair	Moderate: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
Grantfork	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
941:						
Virden	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
991:						
Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Huey	Slight	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
993:						
Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting- Drainage	Irrigation	Terraces and diversions	Grassed waterways
993:						
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
2002:						
Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Urban land.						
2912A:						
Hoyleton	Slight	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Urban land.						
3070 Beaucoup	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
3083 Wabash	Slight	Severe: hard to pack, wetness.	Percs slowly, flooding, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
3131A Alvin	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Erodes easily	Erodes easily.
3288 Petrolia	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
3304A Landes	Severe: seepage.	Severe: seepage, piping.	Deep to water	Favorable	Too sandy, soil blowing.	Favorable.
3333 Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
3334 Birds	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
3402 Colo	Moderate: seepage.	Severe: wetness.	Flooding, frost action.	Wetness, flooding.	Wetness	Wetness.
3603 Blackoar	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
7026 Wagner	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
7084 Okaw	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
7338A Hurst	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
7338B Hurst	Moderate: slope.	Severe: wetness.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
7434B Ridgway	Severe: seepage.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
7436B Meadowbank	Severe: seepage.	Moderate: thin layer.	Deep to water	Slope	Favorable	Favorable.
7466 Bartelso	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
7468 Lakaskia	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
8109 Racoon	Slight	Severe: thin layer, ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
8432A Geff	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, rooting depth, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.

Table 15.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated.)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
2------------- Cisne	0-9	Silt loam-----	CL, CL-ML, ML	A-4	0	0	100	100	90-100	90-100	25-35	5-10
	9-20	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	20-38	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	90-100	90-100	45-60	20-35
	38-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	100	90-100	70-95	50-90	30-50	15-30
3A------------ Hoyleton	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	8-18	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	18-41	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	41-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
3B2----------- Hoyleton	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	7-12	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	12-32	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	32-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
5C2----------- Blair	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	6-26	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	26-60	Silty clay loam, loam, silt loam .	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
5C3----------- Blair	0-4	Silty clay loam.	CL	A-6	0	0-5	95-100	90-100	90-100	85-100	25-40	10-20
	4-30	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	30-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
5D3----------- Blair	0-4	Silty clay loam.	CL	A-6	0	0-5	95-100	90-100	90-100	85-100	25-40	10-20
	4-30	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	30-52	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
	52-60	Silty clay loam, clay loam, silt loam.	CL	A-6	0	0-5	95-100	90-100	85-100	70-90	20-40	10-25
7C3----------- Atlas	0-4	Clay loam-----	CH, CL	A-7	0	0	100	95-100	95-100	75-95	45-65	30-40
	4-55	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	55-60	Silty clay loam, loam, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
8D2----------- Hickory	0-6	Loam----------	CL	A-4, A-6	0	0-1	95-100	90-100	90-100	75-95	20-35	8-15
	6-60	Clay loam, loam.	CL	A-7, A-6	0-1	0-5	95-100	90-100	70-100	65-80	30-50	15-30
8D3----------- Hickory	0-2	Clay loam-----	CL	A-6, A-7	0	0-3	95-100	90-100	90-100	80-95	30-50	15-30
	2-60	Clay loam, loam.	CL	A-7, A-6	0-1	0-5	95-100	90-100	70-100	65-80	30-50	15-30
8F------------ Hickory	0-6	Loam----------	CL	A-4, A-6	0	0-1	95-100	90-100	90-100	75-95	20-35	8-15
	6-9	Loam, silt loam.	CL	A-6	0	0-5	95-100	90-100	80-100	75-95	25-40	10-20
	9-60	Clay loam, loam.	CL	A-7, A-6	0-1	0-5	95-100	90-100	70-100	65-80	30-50	15-30
12------------ Wynoose	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-95	20-35	5-15
	8-17	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	0	100	100	95-100	85-95	15-30	2-15
	17-41	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	100	95-100	85-95	40-55	20-35
	41-49	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	70-90	30-45	15-25
	49-60	Loam, clay loam, silty clay loam.	CL	A-6, A-7	0-1	0-10	95-100	90-100	85-100	70-90	25-45	15-30
13A----------- Bluford	0-7	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	5-15
	7-12	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	95-100	95-100	90-100	20-30	NP-10
	12-36	Silty clay loam, silty clay.	CL	A-7, A-6	0	0	100	95-100	95-100	90-100	35-50	15-30
	36-60	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	---	0-5	100	95-100	90-100	70-90	25-40	5-20

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
13B2----------- Bluford	0-8	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	5-15
	8-15	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	95-100	95-100	90-100	20-30	NP-10
	15-33	Silty clay loam, silty clay.	CL	A-7, A-6	0	0	100	95-100	95-100	90-100	35-50	15-30
	33-60	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	---	0-5	100	95-100	90-100	70-90	25-40	5-20
14B----------- Ava	0-6	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-35	5-15
	6-10	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	10-27	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	27-49	Silty clay loam, silt loam, clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	95-100	90-100	80-90	20-45	5-20
	49-60	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-90	25-40	5-20
46A----------- Herrick	0-18	Silt loam-----	CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	30-40	5-15
	18-23	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-60	25-40
	23-51	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-50	20-35
	51-60	Silt loam, loam, clay loam.	CL	A-6	0	0	100	100	90-100	80-100	30-40	10-20
50------------ Virden	0-7	Silt loam-----	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-20
	7-14	Silty clay --- loam	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-20
	14-44	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	40-55	15-30
	44-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	30-45	10-20
53D----------- Bloomfield	0-7	Fine sand-----	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	60-90	4-20	---	NP
	7-42	Fine sand, loamy fine sand, sand.	SP, SM, SP-SM	A-2-4, A-3	0	0	100	100	70-100	4-35	---	NP
	42-60	Fine sand, loamy fine sand, sand.	SM, SP, SP-SM	A-2-4, A-3	0	0	100	100	65-100	4-35	<20	NP-3

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
112----------- Cowden	0-9	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	3-15
	9-18	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	18-48	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-32
	48-60	Silt loam-----	CL	A-6, A-7-6	0	0	100	100	95-100	95-100	30-45	10-20
113A---------- Oconee	0-9	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	9-18	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	18-33	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	33-47	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
	47-60	Silt loam-----	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
113B2--------- Oconee	0-7	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	7-31	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	31-44	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
	44-60	Silt loam-----	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
119D3--------- Elco	0-4	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	30-45	15-30
	4-14	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	85-100	25-45	10-30
	14-36	Silty clay loam, clay loam, silt loam.	CL	A-7, A-6	0	0	100	90-100	85-95	75-95	25-45	10-30
	36-60	Silty clay loam, loam, clay loam.	CL	A-7, A-6	0	0	100	90-100	80-100	60-95	25-50	10-30
127B---------- Harrison	0-13	Silt loam-----	CL	A-4, A-6	0	0	100	100	100	95-100	30-40	8-15
	13-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-20
	32-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	85-100	80-85	70-80	30-50	10-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
165----------- Weir	0-9	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-17
	9-18	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	95-100	90-100	<25	3-10
	18-52	Silty clay loam, silty clay.	CL	A-7, A-6	0	0	100	100	95-100	90-100	35-50	15-30
	52-60	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-30	9-16
218----------- Newberry	0-9	Silt loam-----	CL	A-6	0	0	100	100	95-100	85-100	30-40	10-20
	9-17	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	8-15
	17-53	Silty clay loam.	CL, CH	A-7, A-6	0	0	100	100	95-100	85-100	35-55	15-30
	53-60	Silty clay loam, clay loam, loam.	CL	A-7, A-6	---	0-5	95-100	90-100	75-100	50-90	30-45	15-25
453B2--------- Muren	0-5	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-30	5-15
	5-46	Silty clay loam, silt loam.	CL	A-6, A-4	0	0	100	100	90-100	80-100	25-35	8-15
	46-60	Silt loam, silt.	CL, CL-ML, ML	A-4	0	0	100	100	90-100	70-90	<25	NP-10
454----------- Iva	0-17	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-100	25-35	5-15
	17-40	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	80-100	35-50	15-30
	40-60	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	25-35	5-15
533. Urban land												
583B2, 583C2-- Pike	0-9	Silt loam-----	CL	A-4, A-6	0	0	100	100	90-100	80-95	25-35	8-15
	9-37	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	85-100	80-90	30-45	10-25
	37-60	Silty clay loam, silt loam, sandy clay loam.	CL, SC	A-6, A-2-6	0	0	80-90	70-90	60-90	30-80	20-35	10-20
583C3--------- Pike	0-6	Silty clay loam.	CL	A-6	0	0	100	100	90-100	80-95	30-40	10-15
	6-50	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	95-100	85-100	80-90	30-45	10-25
	50-60	Silty clay loam, silt loam, sandy clay loam.	CL, SC	A-6, A-2-6	0	0	80-90	70-90	60-90	30-80	20-35	10-20
801----------- Orthents	0-60	Silty clay loam.	---	---	---	---	---	---	---	---	---	15-30
	60-80	Variable------	---	---	---	---	---	---	---	---	---	---

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
912A:												
Hoyleton-----	0-9	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	9-15	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	15-36	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	36-60	Silt loam, clay loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
Darmstadt----	0-14	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	14-20	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	20-40	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	40-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
912B2:												
Hoyleton-----	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	7-12	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	12-32	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	32-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
Darmstadt----	0-6	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	6-14	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	14-27	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	27-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
916A:												
Oconee-------	0-9	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	9-20	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	20-55	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	55-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
916A:												
Darmstadt----	0-11	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	11-27	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	27-60	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
916B2:												
Oconee-------	0-7	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	7-10	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	10-40	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	40-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
Darmstadt----	0-6	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	6-22	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	22-35	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	35-60	Silt loam, silty clay loam, clay loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
934B2:												
Blair--------	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	7-13	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	13-46	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
	46-60	Silty clay loam, clay loam, silt loam.	CL	A-6	0	0-5	95-100	90-100	85-100	70-90	20-40	10-25
Grantfork----	0-5	Silt loam-----	CL	A-6	0	0	100	95-100	85-95	80-90	25-40	10-20
	5-18	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	18-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
934C2:												
Blair	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	8-19	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	19-50	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
	50-60	Loam, clay loam, silt loam.	CL	A-6	0	0-5	95-100	90-100	85-100	70-90	20-40	10-25
Grantfork	0-4	Silt loam	CL	A-6	0	0	100	95-100	85-95	80-90	25-40	10-20
	4-11	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	11-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25
941:												
Virden	0-18	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-20
	18-46	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	40-55	15-30
	46-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	30-45	10-20
Piasa	0-8	Silt loam	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	8-14	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	14-49	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
	49-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
991:												
Cisne	0-8	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	90-100	90-100	25-35	5-10
	8-15	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	15-51	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	90-100	90-100	45-60	20-35
	51-60	Silt loam, loam, clay loam.	CL	A-6	0	0-5	100	90-100	70-95	50-90	25-40	10-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
991:												
Huey---------	0-7	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-95	20-35	3-15
	7-12	Silt, silt loam.	CL, ML, CL-ML	A-6, A-4	0	0	100	100	90-100	85-95	15-30	3-15
	12-15	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-25
	15-51	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30
	51-60	Loam, silt loam, silty clay loam.	CL	A-6	0	0	95-100	90-100	80-95	65-90	20-35	10-20
993:												
Cowden-------	0-9	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	3-15
	9-15	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	15-60	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-32
Piasa--------	0-7	Silt loam-----	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	7-10	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	10-50	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
	50-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
2002:												
Cisne--------	0-9	Silt loam-----	CL, CL-ML, ML	A-4	0	0	100	100	90-100	90-100	25-35	5-10
	9-20	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	20-53	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	90-100	90-100	45-60	20-35
	53-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	100	90-100	70-95	50-90	30-50	15-30
Urban land.												
2912A:												
Hoyleton-----	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	7-16	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	16-60	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
2912A:												
Darmstadt----	0-16	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	16-30	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	30-40	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	40-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Urban land.												
3070---------- Beaucoup	0-14	Silt loam-----	CL, ML	A-6	0	0	100	100	90-100	80-100	30-40	10-20
	14-47	Silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-100	30-45	15-30
	47-60	Stratified very fine sandy loam to silty clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	90-100	65-95	25-45	5-25
3083---------- Wabash	0-26	Silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	95-100	45-65	20-35
	26-60	Silty clay, silty clay loam.	CH	A-7	0	0	100	100	95-100	95-100	60-85	35-55
3131A--------- Alvin	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	80-95	75-95	15-30	NP-15
	7-50	Sandy loam, fine sandy loam.	SM, SC, ML, CL-ML	A-2, A-4, A-6	0	0	95-100	95-100	75-90	20-80	15-40	NP-15
	50-60	Sand, sandy loam.	SP-SM, SM	A-2, A-3, A-4	0	0	95-100	90-100	70-95	5-40	<20	NP-4
3288---------- Petrolia	0-6	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	30-45	10-20
	6-60	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	35-45	15-25
3304A--------- Landes	0-20	Fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	0	100	70-100	70-95	20-50	<25	NP-10
	20-39	Loam, fine sandy loam, loamy fine sand.	SM, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	100	85-100	70-100	15-60	<25	NP-10
	39-60	Stratified sand to silt loam.	SM, SP-SM, SC, SC-SM	A-4, A-2-4	0	0	100	85-100	70-85	10-50	<30	NP-10
3333---------- Wakeland	0-7	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
	7-60	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
3334---------- Birds	0-7	Silt loam-----	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15
	7-60	Silt loam-----	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
3402---------- Colo	0-18	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
	18-53	Silty clay loam.	CL, CH	A-7	0	0	100	100	90-100	90-100	40-55	20-30
	53-60	Silty clay loam, clay loam, silt loam.	CL, CH	A-7	0	0	100	100	95-100	80-100	40-55	15-30
3603---------- Blackoar	0-18	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-18
	18-44	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-18
	44-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	85-100	25-40	5-20
7026---------- Wagner	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	24-35	6-15
	9-19	Silt loam-----	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	3-15
	19-41	Silty clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-60	25-40
	41-60	Silty clay loam.	CL, CH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	15-30
7084---------- Okaw	0-15	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	15-49	Silty clay, clay, silty clay loam.	CH	A-7	0	0	100	95-100	95-100	85-100	50-70	30-50
	49-60	Silty clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-60	25-40
7338A--------- Hurst	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	75-100	20-35	4-15
	8-12	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-35	5-15
	12-60	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-60	20-35
7338B--------- Hurst	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	75-100	20-35	4-15
	7-54	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-60	20-35
	54-60	Stratified sandy clay loam to silty clay.	CL, CH	A-6, A-7	0	0	100	100	90-100	85-100	35-55	15-30
7434B--------- Ridgway	0-8	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	3-15
	8-27	Silty clay loam, silt loam.	CL	A-6	0	0	100	95-100	95-100	90-100	30-40	15-25
	27-52	Clay loam, loam, sandy loam.	CL, SC, SC-SM, ML	A-4, A-6	0	0	90-100	85-100	80-90	35-70	20-40	3-15
	52-60	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2, A-1-b, A-3	0	0	75-100	50-100	20-60	5-30	---	NP

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
7436B---------Meadowbank	0-17	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	3-15
	17-34	Silty clay loam.	CL	A-6	0	0	100	95-100	95-100	90-100	30-40	15-25
	34-45	Loam, sandy loam, clay loam.	CL, SC, SC-SM, ML	A-4, A-6	0	0	90-100	85-100	80-90	35-70	20-40	3-15
	45-60	Sand, loamy sand, sandy loam.	SM, SP-SM	A-2, A-1-b	0	0	75-100	50-100	20-60	10-50	---	NP
7466----------Bartelso	0-12	Silt loam-----	CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	30-40	5-15
	12-35	Silty clay, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	95-100	30-45	15-30
	35-60	Silt loam, silty clay loam.	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
7468----------Lakaskia	0-13	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	95-100	30-40	8-20
	13-26	Silty clay loam, silty clay.	CL	A-7	0	0	100	100	95-100	95-100	40-50	20-30
	26-50	Silty clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	40-55	20-30
	50-60	Silty clay loam, silty clay, loam.	CL	A-6, A-7	0	0	95-100	90-100	80-100	65-100	35-50	15-30
8109----------Racoon	0-6	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-40	8-20
	6-23	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-40	5-20
	23-45	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	15-30
	45-60	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	15-30
8432A---------Geff	0-5	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	95-100	95-100	20-35	4-15
	5-12	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	95-100	95-100	20-35	4-15
	12-33	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	95-100	95-100	90-100	90-100	35-45	15-25
	33-60	Silt loam, loam, sandy loam.	CL-ML, CL	A-4, A-6	0	0-2	90-100	80-100	70-100	50-90	15-30	4-15

Table 16.--Physical and Chemical Properties of the Soils

(The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated.)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2----------------	0-9	15-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.8	Low----------	0.37	3	6	1-3
Cisne	9-20	15-27	1.25-1.45	0.06-0.6	0.18-0.20	4.5-6.0	Low----------	0.37			
	20-38	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High---------	0.37			
	38-60	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate-----	0.37			
3A---------------	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.32	3	6	1-3
Hoyleton	8-18	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low----------	0.43			
	18-30	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High---------	0.43			
	30-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate-----	0.43			
3B2--------------	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.32	3	6	1-3
Hoyleton	7-12	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low----------	0.43			
	12-32	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High---------	0.43			
	32-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate-----	0.43			
5C2--------------	0-6	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
Blair	6-26	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate-----	0.37			
	26-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37			
5C3--------------	0-4	27-35	1.35-1.55	0.2-0.6	0.14-0.18	5.1-7.3	Moderate-----	0.37	4	7	.5-1
Blair	4-30	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate-----	0.37			
	30-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37			
5D3--------------	0-4	27-35	1.35-1.55	0.2-0.6	0.14-0.18	5.1-7.3	Moderate-----	0.37	4	7	.5-1
Blair	4-30	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate-----	0.37			
	30-52	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37			
	52-60	20-27	1.35-1.60	0.2-0.6	0.19-0.22	5.6-7.8	Low----------	0.37			
7C3--------------	0-4	30-40	1.35-1.55	0.06-0.2	0.11-0.16	4.5-7.3	High---------	0.32	2	6	.5-2
Atlas	4-55	35-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.3	High---------	0.32			
	55-60	20-30	1.35-1.55	<0.06	0.07-0.19	4.5-7.8	High---------	0.32			
8D2--------------	0-6	15-27	1.20-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
Hickory	6-60	24-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.37			
8D3--------------	0-2	27-35	1.30-1.45	0.6-2.0	0.18-0.20	5.1-7.3	Moderate-----	0.37	4	6	.5-1
Hickory	2-60	24-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.37			
8F---------------	0-6	15-27	1.20-1.35	0.6-2.0	0.20-0.22	5.1-7.3	Low----------	0.37	5	6	1-2
Hickory	6-9	15-27	1.30-1.45	0.6-2.0	0.17-0.19	4.5-6.0	Low----------	0.37			
	9-60	24-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.37			
12---------------	0-8	15-25	1.25-1.45	0.6-2.0	0.22-0.24	4.5-7.8	Low----------	0.43	3	6	.5-2
Wynoose	8-17	12-18	1.30-1.50	0.06-0.2	0.18-0.20	3.6-7.3	Low----------	0.43			
	17-41	35-42	1.40-1.60	<0.06	0.09-0.13	3.6-6.0	High---------	0.43			
	41-49	25-37	1.50-1.70	0.06-0.2	0.11-0.15	3.6-6.0	Moderate-----	0.43			
	49-60	20-35	1.60-1.80	0.06-0.2	0.10-0.16	4.5-7.3	Moderate-----	0.32			
13A--------------	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
Bluford	7-12	15-25	1.40-1.60	0.2-0.6	0.18-0.20	3.6-6.0	Low----------	0.43			
	12-36	35-42	1.45-1.65	0.06-0.6	0.11-0.20	3.6-5.5	Moderate-----	0.43			
	36-60	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.0	Moderate-----	0.43			

Table 16.--Physical and Chemical Properties of the Soils-Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
13B2------------- Bluford	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	8-15	15-25	1.40-1.60	0.2-0.6	0.18-0.20	3.6-6.0	Low----------	0.43			
	15-41	35-42	1.45-1.65	0.06-0.6	0.11-0.20	3.6-5.5	Moderate-----	0.43			
	41-60	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.0	Moderate-----	0.43			
14B-------------- Ava	0-6	20-27	1.40-1.60	0.6-2.0	0.21-0.24	4.5-7.3	Low----------	0.43	4	6	.5-2
	6-10	22-33	1.40-1.60	0.6-2.0	0.18-0.21	4.5-5.5	Moderate-----	0.43			
	10-27	24-35	1.50-1.70	0.2-0.6	0.18-0.21	4.5-5.5	Moderate-----	0.43			
	27-49	20-30	1.55-1.80	<0.06	0.09-0.11	4.5-5.5	Low----------	0.43			
	49-60	20-30	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low----------	0.43			
46A-------------- Herrick	0-18	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	3-4
	18-23	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High---------	0.43			
	23-51	25-40	1.20-1.40	0.2-0.6	0.16-0.20	5.6-7.3	Moderate-----	0.43			
	51-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate-----	0.43			
50--------------- Virden	0-7	25-27	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	6	4-6
	7-14	27-30	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28			
	14-44	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.28			
	44-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
53D-------------- Bloomfield	0-7	2-10	1.45-1.65	6.0-20	0.09-0.11	5.1-7.3	Low----------	0.15	5	1	.5-2
	7-42	2-10	1.45-1.65	6.0-20	0.08-0.12	5.1-7.3	Low----------	0.15			
	42-60	5-13	1.60-1.80	6.0-20	0.08-0.12	5.1-7.8	Low----------	0.15			
112-------------- Cowden	0-9	17-27	1.30-1.50	0.6-2.0	0.22-0.25	5.6-7.3	Low----------	0.37	3	6	2-3
	9-18	17-27	1.25-1.45	0.06-0.2	0.18-0.20	4.5-6.0	Low----------	0.37			
	18-48	35-42	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
	48-60	20-27	1.50-1.70	0.2-0.6	0.17-0.22	5.6-7.8	Moderate-----	0.37			
113A------------- Oconee	0-9	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3-2	6	2-3
	9-18	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	18-33	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	33-47	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
	47-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
113B2------------ Oconee	0-7	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3-2	6	2-3
	7-31	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	31-44	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
	44-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
119D3------------ Elco	0-4	25-33	1.20-1.35	0.6-2.0	0.18-0.21	5.6-7.3	Moderate-----	0.37	4	7	.5-1
	4-14	23-35	1.25-1.45	0.6-2.0	0.18-0.21	5.1-7.8	Moderate-----	0.37			
	14-36	23-35	1.40-1.60	0.2-0.6	0.16-0.20	5.1-7.8	Moderate-----	0.37			
	36-60	25-45	1.45-1.70	0.06-0.6	0.14-0.20	5.1-7.8	High---------	0.37			
127B------------- Harrison	0-13	20-27	1.15-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	2-4
	13-32	25-35	1.25-1.40	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-----	0.43			
	32-60	20-35	1.30-1.45	0.6-2.0	0.14-0.20	5.6-7.3	Moderate-----	0.43			
165-------------- Weir	0-9	12-27	1.30-1.50	0.2-0.6	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	9-18	12-20	1.40-1.55	0.06-0.2	0.17-0.20	4.5-7.3	Low----------	0.43			
	18-52	35-40	1.40-1.60	<0.06	0.18-0.20	4.5-6.0	High---------	0.43			
	52-60	20-27	1.45-1.65	0.06-0.2	0.20-0.22	4.5-6.5	Low----------	0.43			
218-------------- Newberry	0-9	20-27	1.25-1.50	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	2-3
	9-17	18-25	1.30-1.55	0.2-0.6	0.20-0.22	4.5-6.0	Low----------	0.37			
	17-53	27-35	1.30-1.55	0.06-0.2	0.18-0.20	4.5-6.5	Moderate-----	0.37			
	53-60	22-33	1.50-1.70	0.06-0.2	0.14-0.20	4.5-7.3	Moderate-----	0.37			

Table 16.--Physical and Chemical Properties of the Soils-Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
453B2------------ Muren	0-5	15-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	.5-2
	5-46	22-30	1.35-1.50	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	46-60	8-20	1.30-1.45	0.6-2.0	0.20-0.22	5.6-6.5	Low----------	0.37			
454-------------- Iva	0-17	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.43	5	6	1-3
	17-40	22-30	1.35-1.55	0.6-2.0	0.18-0.20	5.1-6.5	Moderate-----	0.43			
	40-60	10-20	1.35-1.55	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
533. Urban land											
583B2, 583C2----- Pike	0-9	18-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5-4	6	.5-2
	9-37	22-35	1.30-1.45	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.37			
	37-60	18-35	1.30-1.45	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.37			
583C3------------ Pike	0-6	27-30	1.25-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	4	7	.5-1
	6-50	22-35	1.30-1.45	0.6-2.0	0.18-0.22	4.5-6.5	Low----------	0.37			
	50-60	18-35	1.30-1.45	0.6-2.0	0.12-0.18	4.5-6.0	Low----------	0.37			
801-------------- Orthents	0-60	18-35	1.45-1.65	0.2-2.0	0.12-0.18	---	Moderate-----	0.32	5	6	---
	60-80	---	---	0.2-2.0	---	---	---	---			
912A:											
Hoyleton--------	0-9	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.32	3	6	1-3
	9-15	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low----------	0.43			
	15-36	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High---------	0.43			
	36-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate-----	0.43			
Darmstadt-------	0-14	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	14-20	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	20-40	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	40-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
912B2:											
Hoyleton--------	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.32	3	6	1-3
	7-12	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low----------	0.43			
	12-32	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High---------	0.43			
	32-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate-----	0.43			
Darmstadt-------	0-6	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	6-14	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	14-27	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	27-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
916A:											
Oconee----------	0-9	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3-2	6	2-3
	9-20	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	20-55	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	55-60	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
Darmstadt-------	0-11	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	11-27	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	27-60	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
916B2:											
Oconee----------	0-7	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3-2	6	2-3
	7-10	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	10-40	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	40-60	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			

Table 16.--Physical and Chemical Properties of the Soils-Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
916B2:											
Darmstadt-------	0-6	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	6-22	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	22-35	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	35-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
934B2:											
Blair-----------	0-7	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	7-13	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate-----	0.37			
	13-46	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37			
	46-60	20-27	1.35-1.60	0.2-0.6	0.19-0.22	5.6-7.8	Low----------	0.37			
Grantfork-------	0-5	20-27	1.35-1.55	0.2-0.6	0.18-0.20	4.5-7.8	Low----------	0.37	5	6	.5-1
	5-18	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	18-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
934C2:											
Blair-----------	0-8	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	8-19	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate-----	0.37			
	19-50	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate-----	0.37			
	50-60	20-27	1.35-1.60	0.2-0.6	0.19-0.22	5.6-7.8	Low----------	0.37			
Grantfork-------	0-4	20-27	1.35-1.55	0.2-0.6	0.18-0.20	4.5-7.8	Low----------	0.37	5	6	.5-1
	4-11	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	11-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
941:											
Virden----------	0-18	25-27	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	6	4-6
	18-46	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.28			
	46-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
Piasa-----------	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	8-14	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	14-49	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	49-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
991:											
Cisne-----------	0-8	15-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.8	Low----------	0.37	3	6	1-3
	8-15	15-27	1.25-1.45	0.06-0.6	0.18-0.20	4.5-6.0	Low----------	0.37			
	15-51	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High---------	0.37			
	51-60	22-30	1.60-1.80	<0.06	0.14-0.22	5.6-7.3	Moderate-----	0.37			
Huey------------	0-7	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	3	6	1-3
	7-12	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low----------	0.43			
	12-15	20-35	1.40-1.60	0.06-0.2	0.10-0.18	5.6-8.4	Moderate-----	0.43			
	15-51	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	51-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
993:											
Cowden----------	0-9	17-27	1.30-1.50	0.6-2.0	0.22-0.25	5.6-7.3	Low----------	0.37	3	6	2-3
	9-15	17-27	1.25-1.45	0.06-0.2	0.18-0.20	4.5-6.0	Low----------	0.37			
	15-60	35-42	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
Piasa-----------	0-7	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	7-10	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	10-50	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	50-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			

Table 16.--Physical and Chemical Properties of the Soils-Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2002:											
Cisne-----------	0-9	15-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.8	Low----------	0.37	3	6	1-3
	9-20	15-27	1.25-1.45	0.06-0.6	0.18-0.20	4.5-6.0	Low----------	0.37			
	20-53	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High---------	0.37			
	53-60	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate-----	0.37			
Urban land.											
2912A:											
Hoyleton--------	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.32	3	6	1-3
	7-16	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low----------	0.43			
	16-60	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High---------	0.43			
Darmstadt-------	0-16	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	.5-2
	16-30	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	30-40	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	40-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low----------	0.43			
Urban land.											
3070------------- Beaucoup	0-14	18-27	1.25-1.40	0.2-0.6	0.22-0.24	5.6-7.8	Low----------	0.32	5	6	5-6
	14-47	27-35	1.30-1.50	0.2-0.6	0.18-0.20	5.6-7.8	Moderate-----	0.32			
	47-60	15-30	1.35-1.55	0.2-0.6	0.18-0.22	5.6-7.8	Moderate-----	0.32			
3083------------- Wabash	0-26	35-40	1.30-1.35	0.2-0.6	0.21-0.23	5.6-7.3	High---------	0.28	5	4	4-7
	26-60	35-45	1.30-1.45	<0.06	0.11-0.13	5.6-7.3	High---------	0.28			
3131A------------ Alvin	0-7	15-25	1.30-1.45	0.6-2.0	0.22-0.25	4.5-7.3	Low----------	0.37	5	5	.5-1
	7-50	15-18	1.45-1.65	0.6-6.0	0.14-0.16	4.5-6.0	Low----------	0.24			
	50-60	3-10	1.55-1.65	2.0-6.0	0.08-0.14	5.1-8.4	Low----------	0.24			
3288------------- Petrolia	0-6	27-35	1.20-1.40	0.2-0.6	0.21-0.23	5.6-8.4	Moderate-----	0.32	5	7	2-3
	6-60	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate-----	0.32			
3304A------------ Landes	0-20	7-20	1.40-1.60	2.0-6.0	0.13-0.20	5.6-8.4	Low----------	0.20	4	3	1-2
	20-39	5-18	1.60-1.70	2.0-6.0	0.10-0.15	5.6-8.4	Low----------	0.32			
	39-60	5-18	1.60-1.80	6.0-20	0.05-0.15	5.6-8.4	Low----------	0.20			
3333------------- Wakeland	0-7	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	5	1-3
	7-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
3334------------- Birds	0-7	15-25	1.30-1.50	0.2-0.6	0.21-0.25	5.6-7.8	Low----------	0.43	5	6	1-3
	7-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low----------	0.43			
3402------------- Colo	0-18	20-26	1.25-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Moderate-----	0.28	5	6	3-5
	18-53	30-35	1.25-1.35	0.6-2.0	0.18-0.20	5.6-7.3	Moderate-----	0.28			
	53-60	25-35	1.35-1.45	0.6-2.0	0.18-0.20	6.1-7.3	Moderate-----	0.32			
3603------------- Blackoar	0-18	18-27	1.35-1.45	0.6-2.0	0.20-0.24	5.6-7.3	Low----------	0.28	5	6	2-4
	18-44	18-27	1.35-1.45	0.6-2.0	0.20-0.22	5.6-7.3	Low----------	0.43			
	44-60	18-30	1.35-1.45	0.6-2.0	0.18-0.22	5.6-7.3	Low----------	0.43			
7026------------- Wagner	0-9	20-25	1.35-1.55	0.2-0.6	0.22-0.24	5.1-8.4	Low----------	0.28	3	6	2-3
	9-19	18-25	1.35-1.55	0.2-0.6	0.20-0.22	5.1-8.4	Low----------	0.28			
	19-41	35-47	1.35-1.55	<0.06	0.09-0.20	4.5-7.3	High---------	0.28			
	41-60	35-40	1.35-1.55	<0.06	0.18-0.20	6.6-8.4	Moderate-----	0.28			
7084------------- Okaw	0-15	15-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	15-49	40-60	1.35-1.60	<0.06	0.09-0.18	4.5-6.0	High---------	0.32			
	49-60	35-47	1.35-1.55	<0.06	0.09-0.20	4.5-7.3	High---------	0.28			

Table 16.--Physical and Chemical Properties of the Soils-Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
7338A------------ Hurst	0-8	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	1-2
	8-12	18-30	1.30-1.50	0.2-0.6	0.20-0.22	3.6-6.5	Low----------	0.43			
	12-60	35-48	1.45-1.70	<0.06	0.10-0.17	3.6-7.3	High---------	0.32			
7338B------------ Hurst	0-7	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	1-2
	7-54	35-48	1.45-1.70	<0.06	0.10-0.17	3.6-7.3	High---------	0.32			
	54-60	20-45	1.50-1.70	<0.06	0.10-0.18	4.5-7.8	High---------	0.32			
7434B------------ Ridgway	0-8	14-27	1.15-1.35	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.37	5	6	1-3
	8-27	22-35	1.35-1.55	0.6-2.0	0.16-0.20	4.5-7.3	Moderate-----	0.43			
	27-52	10-30	1.45-1.65	0.6-6.0	0.11-0.18	4.5-6.5	Low----------	0.32			
	52-60	2-10	1.55-1.85	6.0-20	0.05-0.10	5.1-7.3	Low----------	0.17			
7436B------------ Meadowbank	0-17	15-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low----------	0.28	5	6	3-5
	17-34	27-35	1.35-1.55	0.6-2.0	0.16-0.19	5.1-7.3	Moderate-----	0.32			
	34-45	10-30	1.45-1.65	0.6-6.0	0.10-0.18	4.5-7.3	Low----------	0.24			
	45-60	2-10	1.55-1.80	6.0-20	0.05-0.10	5.1-7.3	Low----------	0.17			
7466------------- Bartelso	0-12	18-28	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.28	5	6	2-5
	12-35	36-42	1.25-1.40	0.06-0.2	0.12-0.17	5.1-7.8	High---------	0.43			
	35-60	29-35	1.35-1.55	0.06-0.2	0.15-0.18	6.1-8.4	Moderate-----	0.43			
7468------------- Lakaskia	0-13	20-30	1.15-1.35	0.6-2.0	0.18-0.24	5.6-7.3	Low----------	0.32	3	6	2-3
	13-26	30-42	1.30-1.45	0.06-0.2	0.15-0.18	5.6-7.3	High---------	0.37			
	26-50	35-45	1.35-1.50	0.06-0.2	0.14-0.18	6.1-7.8	High---------	0.37			
	50-60	25-42	1.40-1.55	0.06-0.2	0.12-0.16	7.4-8.4	Moderate-----	0.37			
8109------------- Racoon	0-6	20-27	1.30-1.50	0.2-0.6	0.22-0.24	4.5-7.3	Moderate-----	0.37	3	6	1-2
	6-23	18-25	1.35-1.50	0.2-0.6	0.20-0.22	4.5-7.3	Moderate-----	0.37			
	23-45	27-35	1.35-1.60	0.06-0.2	0.18-0.20	4.5-5.5	High---------	0.37			
	45-60	18-30	1.40-1.65	0.2-0.6	0.09-0.17	5.6-7.3	Moderate-----	0.37			
8432A------------ Geff	0-5	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-3
	5-12	18-27	1.35-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.43			
	12-33	24-35	1.35-1.55	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.43			
	33-60	15-30	1.40-1.75	0.6-2.0	0.15-0.18	4.5-7.3	Low----------	0.32			

Table 17.--Soil and Water Features

("Flooding," "water table," and such terms as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated.)

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
2----------------- Cisne	D	None---------	---	---	0-2.0	Perched	Feb-Jun	High-----	High-----	Moderate.
3A, 3B2----------- Hoyleton	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
5C2, 5C3, 5D3----- Blair	C	None---------	---	---	1.5-3.5	Apparent	Mar-Jun	High-----	High-----	High.
7C3--------------- Atlas	D	None---------	---	---	1.0-2.0	Perched	Apr-Jun	High-----	High-----	Moderate.
8D2, 8D3, 8F------ Hickory	C	None---------	---	---	4.0-6.0	Apparent	Jan-Apr	Moderate	Moderate	Moderate.
12---------------- Wynoose	D	None---------	---	---	0-2.0	Perched	Mar-Jun	High-----	High-----	High.
13A, 13B2--------- Bluford	C	None---------	---	---	1.0-3.0	Perched	Mar-Jun	High-----	High-----	High.
14B--------------- Ava	C	None---------	---	---	1.5-3.5	Perched	Mar-Jun	High-----	Moderate	High.
46A--------------- Herrick	B	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
50---------------- Virden	B/D	None---------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
53D--------------- Bloomfield	A	None---------	---	---	>6.0	---	---	Low------	Low------	High.
112--------------- Cowden	D	None---------	---	---	0-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
113A, 113B2------- Oconee	C	None---------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
119D3------------- Elco	B	None---------	---	---	2.5-4.5	Perched	Mar-May	High-----	High-----	Moderate.
127B-------------- Harrison	B	None---------	---	---	3.0-6.0	Perched	Feb-May	High-----	High-----	Moderate.
165--------------- Weir	D	None---------	---	---	+.5-2.0	Perched	Feb-Jun	High-----	High-----	High.
218--------------- Newberry	C	None---------	---	---	0-2.0	Apparent	Mar-Jun	High-----	High-----	High.
453B2------------- Muren	B	None---------	---	---	2.0-6.0	Apparent	Mar-Apr	High-----	High-----	Moderate.

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
454------------- Iva	C	None--------	---	---	1.0-3.0	Apparent	Jan-Apr	High-----	High-----	Moderate.
533. Urban land										
583B2, 583C2, 583C3----------- Pike	B	None--------	---	---	>6.0	---	---	High-----	Low------	High.
801------------- Orthents	---	None--------	---	---	1.0-3.0	---	---	---	---	---
912A, 912B2:										
Hoyleton---------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-May	High-----	High-----	High.
916A, 916B2:										
Oconee-----------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-May	High-----	High-----	High.
934B2, 934C2:										
Blair------------	C	None--------	---	---	1.5-3.5	Apparent	Mar-Jun	High-----	High-----	High.
Grantfork--------	D	None--------	---	---	1.0-3.0	Perched	Jan-May	High-----	High-----	Low.
941:										
Virden-----------	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Piasa------------	D	None--------	---	---	+.5-2.0	Perched	Feb-May	High-----	High-----	Low.
991:										
Cisne------------	D	None--------	---	---	0-2.0	Perched	Feb-Jun	High-----	High-----	Moderate.
Huey-------------	D	None--------	---	---	+.5-2.0	Perched	Mar-Jun	High-----	High-----	Low.
993:										
Cowden-----------	D	None--------	---	---	0-2.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
Piasa------------	D	None--------	---	---	+.5-2.0	Perched	Feb-May	High-----	High-----	Low.
2002:										
Cisne------------	D	None--------	---	---	0-2.0	Perched	Feb-Jun	High-----	High-----	Moderate.
Urban land.										
2912A:										
Hoyleton---------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	High-----	High-----	High.
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-May	High-----	High-----	High.
Urban land.										
3070------------- Beaucoup	B/D	Frequent----	Brief-----	Mar-Jun	+.5-2.0	Apparent	Mar-Jun	High-----	High-----	Low.

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
3083----------- Wabash	C	Frequent----	Brief-----	Nov-Jun	0.-2.0	Apparent	Nov-Jul	High-----	High-----	Moderate.
3131A---------- Alvin	B	Frequent----	Brief-----	Feb-Apr	>6.0	---	---	Moderate	Low------	High.
3288----------- Petrolia	C/D	Frequent----	Brief-----	Mar-Jun	+.5-3.0	Apparent	Apr-Jun	High-----	High-----	Low.
3304A---------- Landes	B	Frequent----	Brief-----	Jan-Jun	>6.0	---	---	Moderate	Low------	Low.
3333----------- Wakeland	C	Frequent----	Brief-----	Jan-May	1.0-3.0	Apparent	Jan-Apr	High-----	High-----	Low.
3334----------- Birds	C/D	Frequent----	Brief-----	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	High-----	High-----	Moderate.
3402----------- Colo	B/D	Frequent----	Brief-----	Feb-Nov	1.0-3.0	Apparent	Nov-Jul	High-----	High-----	Moderate.
3603----------- Blackoar	B/D	Frequent----	Brief-----	Nov-May	0-1.0	Apparent	Nov-May	High-----	High-----	Low.
7026----------- Wagner	D	Rare--------	---	---	0-2.0	Apparent	Mar-Jun	Moderate	High-----	High.
7084----------- Okaw	D	Rare--------	---	---	+.5-1.0	Apparent	Mar-Jun	High-----	High-----	High.
7338A, 7338B------ Hurst	D	Rare--------	---	---	1.0-3.0	Apparent	Feb-Apr	Moderate	High-----	High.
7434B---------- Ridgway	B	Rare--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
7436B---------- Meadowbank	B	Rare--------	---	---	>6.0	---	---	High-----	Moderate	Moderate.
7466----------- Bartelso	D	Rare--------	---	---	1.0-3.0	Apparent	Feb-Jun	High-----	High-----	High.
7468----------- Lakaskia	D	Rare--------	---	---	0-1.0	Perched	Nov-Apr	High-----	High-----	Low.
8109----------- Racoon	C/D	Occasional	Brief-----	Mar-May	+.5-1.0	Apparent	Mar-Jun	High-----	High-----	High.
8432A---------- Geff	C	Occasional	Brief-----	Feb-Apr	1.0-3.0	Apparent	Feb-Jun	High-----	High-----	High.

Table 18.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.)

Soil name	Family or higher taxonomic class
Alvin	Coarse-loamy, mixed, mesic Typic Hapludalfs
*Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
*Ava	Fine-silty, mixed, mesic Typic Fragiudalfs
Bartelso	Fine, mixed, mesic Aquic Argiudolls
Beaucoup	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Blackoar	Fine-silty, mixed, mesic Fluvaquentic Haplaquolls
Blair	Fine-silty, mixed, mesic Aquic Hapludalfs
Bloomfield	Sandy, mixed, mesic Psammentic Hapludalfs
Bluford	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Cisne	Fine, montmorillonitic, mesic Mollic Albaqualfs
Colo	Fine-silty, mixed, mesic Cumulic Haplaquolls
Cowden	Fine, montmorillonitic, mesic Mollic Albaqualfs
Darmstadt	Fine-silty, mixed, mesic Albic Natraqualfs
Elco	Fine-silty, mixed, mesic Typic Hapludalfs
Geff	Fine-silty, mixed, mesic Aquic Hapludalfs
Grantfork	Fine-loamy, mixed, mesic, sloping Aeric Ochraqualfs
Harrison	Fine-silty, mixed, mesic Typic Argiudolls
Herrick	Fine, montmorillonitic, mesic Aquic Argiudolls
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
Hoyleton	Fine, montmorillonitic, mesic Aquollic Hapludalfs
Huey	Fine-silty, mixed, mesic Typic Natraqualfs
Hurst	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Iva	Fine-silty, mixed, mesic Aeric Ochraqualfs
Lakaskia	Fine, mixed, mesic Typic Argiaquolls
Landes	Coarse-loamy, mixed, mesic Fluventic Hapludolls
Meadowbank	Fine-silty, mixed, mesic Typic Argiudolls
Muren	Fine-silty, mixed, mesic Aquic Hapludalfs
Newberry	Fine-silty, mixed, mesic Mollic Ochraqualfs
Oconee	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Okaw	Fine, montmorillonitic, mesic Typic Albaqualfs
Orthents	Fine-silty, mixed, nonacid, mesic Aquic Udorthents
Petrolia	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Piasa	Fine, montmorillonitic, mesic Mollic Natraqualfs
Pike	Fine-silty, mixed, mesic Ultic Hapludalfs
Racoon	Fine-silty, mixed, mesic Typic Ochraqualfs
Ridgway	Fine-silty, mixed, mesic Typic Hapludalfs
Virden	Fine, montmorillonitic, mesic Typic Argiaquolls
Wabash	Fine, montmorillonitic, mesic Cumulic Haplaquolls
Wagner	Fine, montmorillonitic, mesic Mollic Albaqualfs
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Weir	Fine, montmorillonitic, mesic Typic Ochraqualfs
Wynoose	Fine, montmorillonitic, mesic Typic Albaqualfs

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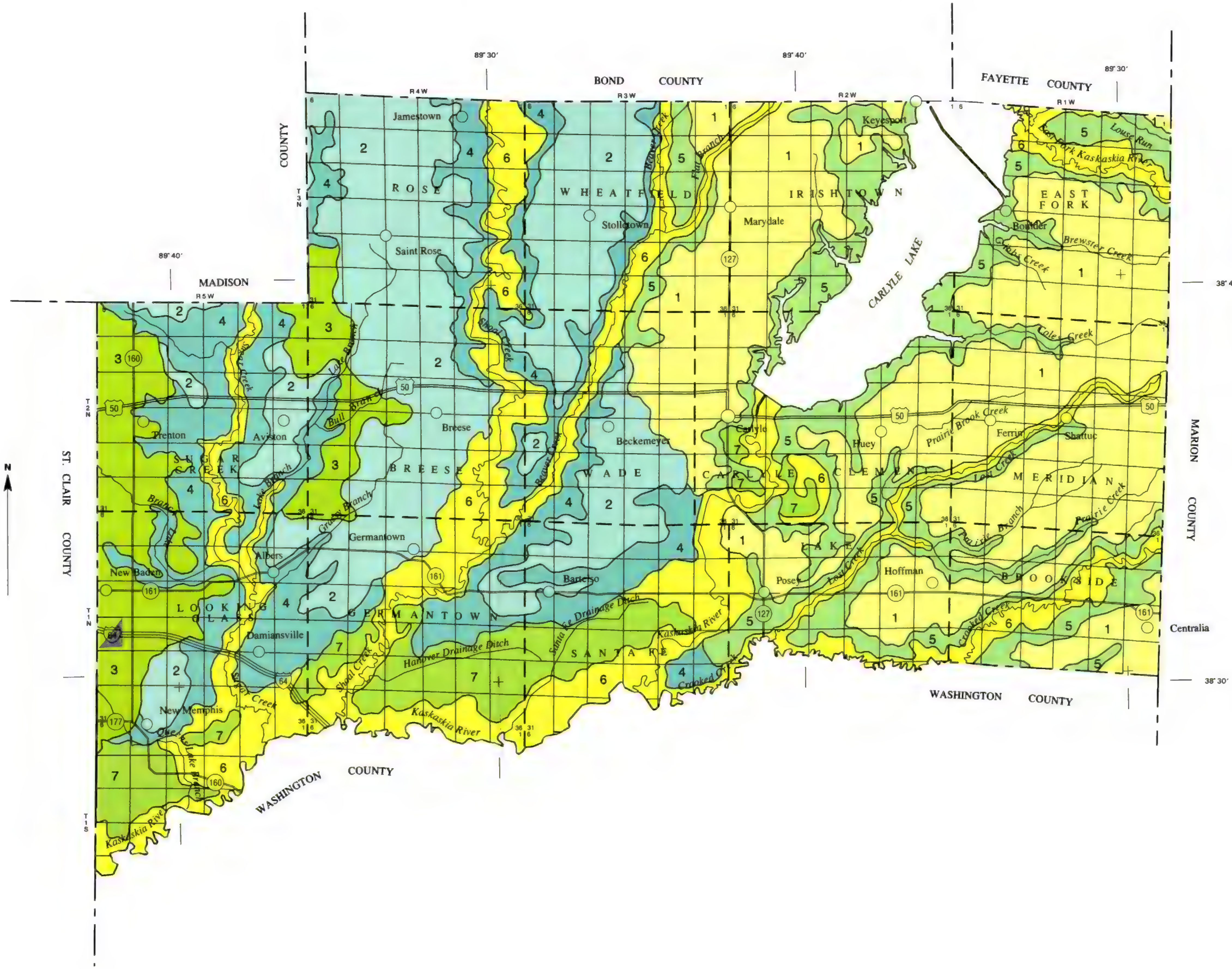


SOIL LEGEND*

1	Hoyleton-Darmstadt-Cisne Association
2	Oconee-Cowden-Darmstadt Association
3	Herrick-Virden-Piasa Association
4	Blair-Muren-Iva Association
5	Bluford-Hickory-Blair Association
6	Wakeland-Birds-Beaucoup Association
7	Wagner-Racoon-Lakaskia Association

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 2000

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
IN COOPERATION WITH
ILLINOIS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

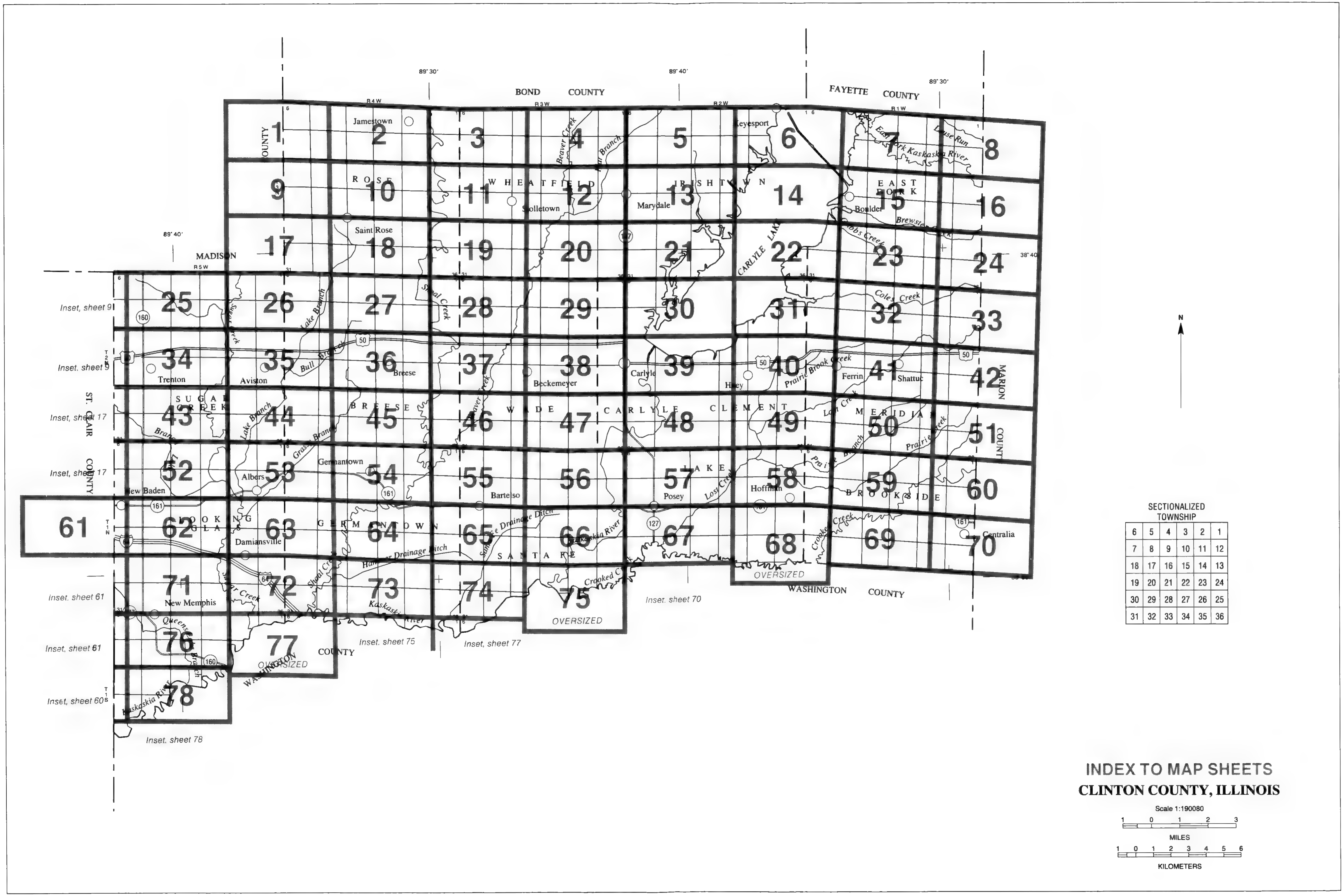
CLINTON COUNTY, ILLINOIS

Scale 1:190080

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS
CLINTON COUNTY, ILLINOIS

SOIL LEGEND

Map symbols consist of numbers or a combination of numbers and letters. The initial numbers represent the kind of soil. A capital letter following those letters indicates the class of slope. Symbols without a slope letter generally are for nearly level soils or for miscellaneous areas. A final number of 2 after the slope letter indicates that the soil is moderately eroded, and a number of 3 after the slope letter indicates that the soil is severely eroded.

SYMBOL	NAME
2	Cisne silt loam
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
5C2	Blair silt loam, 5 to 10 percent slopes, eroded
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded
5D3	Blair silty clay loam, 10 to 15 percent slopes, severely eroded
7C3	Atlas clay loam, 5 to 10 percent slopes, severely eroded
8D2	Hickory loam, 10 to 15 percent slopes, eroded
8D3	Hickory clay loam, 10 to 15 percent slopes, severely eroded
8F	Hickory silt loam, 15 to 30 percent slopes
12	Wynoose silt loam
13A	Bluford silt loam, 0 to 2 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
46A	Herrick silt loam, 0 to 2 percent slopes
50	Virden silt loam
53D	Bloomfield fine sand, 10 to 15 percent slopes
112	Cowden silt loam
113A	Oconee silt loam, 0 to 2 percent slopes
113B2	Oconee silt loam, 2 to 5 percent slopes, eroded
119D3	Elco silty clay loam, 10 to 15 percent slopes, severely eroded
127B	Harrison silt loam, 2 to 5 percent slopes
165	Weir silt loam
218	Newberry silt loam
453B2	Muren silt loam, 2 to 5 percent slopes, eroded
454	Iva silt loam
533	Urban land
583B2	Pike silt loam, 2 to 5 percent slopes, eroded
583C2	Pike silt loam, 5 to 10 percent slopes, eroded
583C3	Pike silty clay loam, 5 to 10 percent slopes, severely eroded
801	Orthents, silty, undulating
912A	Hoyleton-Darmstadt complex, 0 to 2 percent slopes
912B2	Hoyleton-Darmstadt complex, 2 to 5 percent slopes, eroded
916A	Oconee-Darmstadt complex, 0 to 2 percent slopes
916B2	Oconee-Darmstadt complex, 2 to 5 percent slopes, eroded
934B2	Blair-Grantfork complex, 2 to 5 percent slopes, eroded
934C2	Blair-Grantfork complex, 5 to 10 percent slopes, eroded
941	Virden-Piasa complex
991	Cisne-Huey complex
993	Cowden-Piasa complex
2002	Cisne-Urban land complex
2912A	Hoyleton-Darmstadt-Urban land complex, 0 to 2 percent slopes
3070	Beaucoup silt loam, frequently flooded
3083	Wabash silty clay, frequently flooded
3131A	Alvin silt loam, 0 to 2 percent slopes, frequently flooded
3288	Petrolia silty clay loam, frequently flooded
3304A	Landes fine sandy loam, 0 to 2 percent slopes, frequently flooded
3333	Wakeland silt loam, frequently flooded
3334	Birds silt loam, frequently flooded
3402	Colo silt loam, frequently flooded
3603	Blackoar silt loam, frequently flooded
7026	Wagner silt loam, rarely flooded
7084	Okaw silt loam, rarely flooded
7338A	Hurst silt loam, 0 to 2 percent slopes, rarely flooded
7338B	Hurst silt loam, 2 to 5 percent slopes, eroded, rarely flooded
7434B	Ridgway silt loam, 2 to 5 percent slopes, rarely flooded
7436B	Meadowbank silt loam, 2 to 5 percent slopes, rarely flooded
7466	Bartelso silt loam, rarely flooded
7468	Lakaskia silt loam, rarely flooded
8109	Racoon silt loam, occasionally flooded
8432A	Geff silt loam, 0 to 2 percent slopes, occasionally flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- County or parish
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (FLOOD POOL LINE)

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER (sections and land grants)

ROAD EMBLEM & DESIGNATIONS

- Interstate (173)
- Federal (287)
- State (52)

RAILROAD

LEVEES

- Without road

DAMS

- Large (to scale)
- Medium or Small (Named where applicable) (Water; W)

PITS

- Gravel pit

MISCELLANEOUS CULTURAL FEATURES

- Church

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (Water)
- Intermittent (Int)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (5C2, 8D2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Rock outcrop (includes sandstone and shale)
- Sandy spot
- Severely eroded spot
- Area severely damaged by oil waste materials
- Miscellaneous and ad hoc symbols represent soil or miscellaneous areas less than 3 acres in size.

1

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 1

1 MILE

1 KILOMETER

SCALE 1:15 840

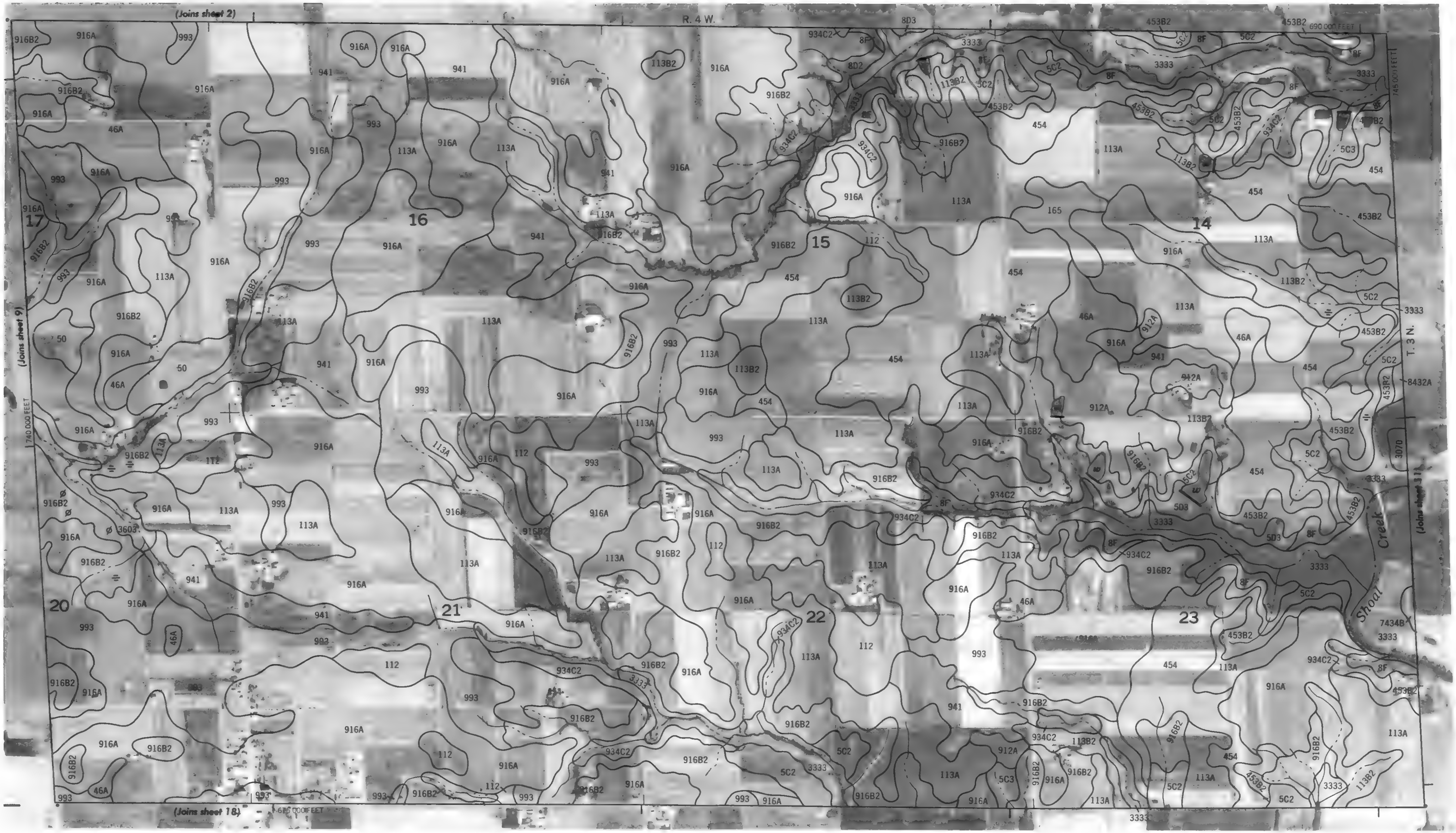
0 1/4 1/2 3/4 1

0 0.5 1

(10)

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 10

N



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1 KILOMETER
SCALE 1:15 840
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0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 10

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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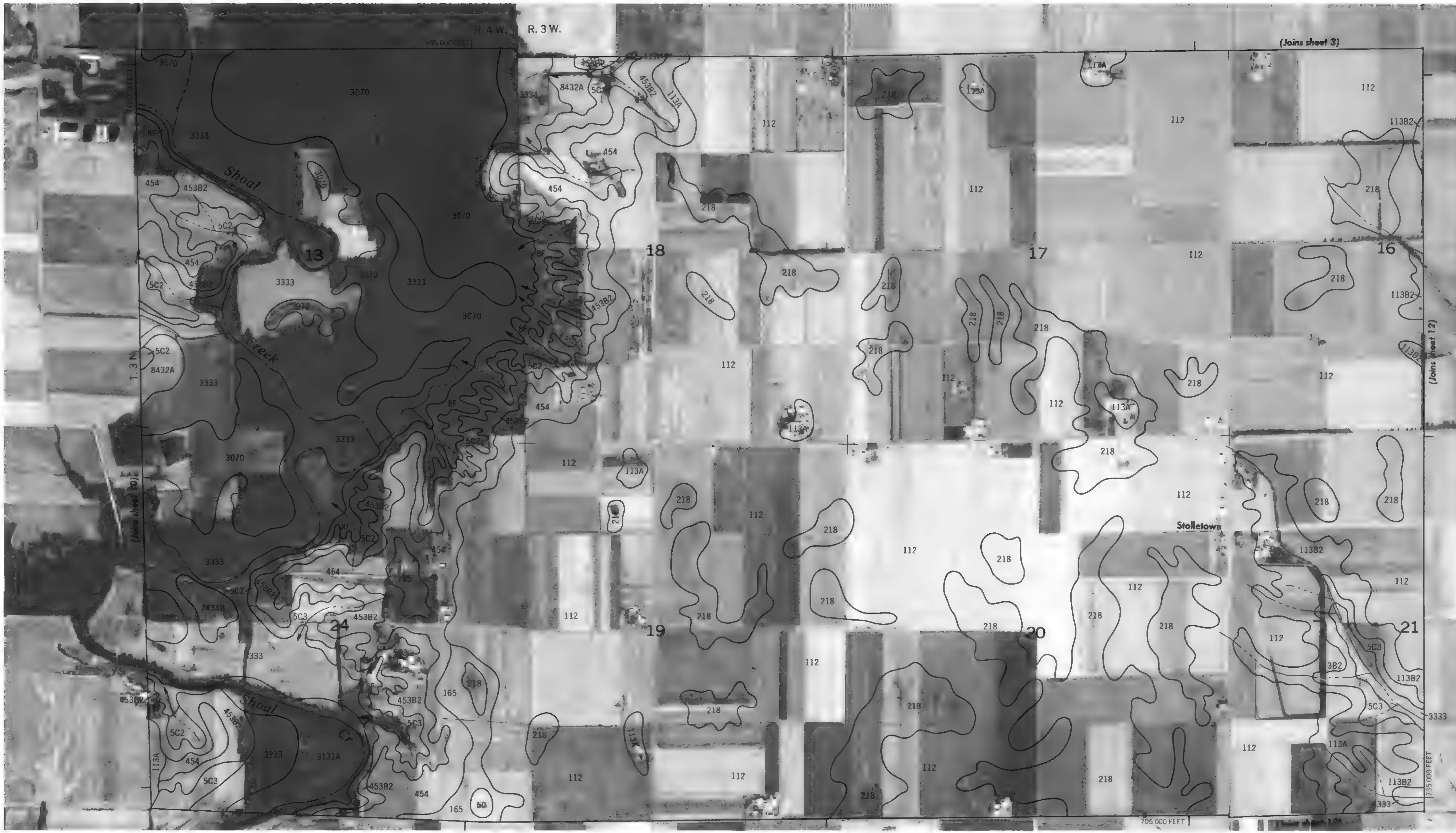

SCALE 1:15 840

1 MILE

1 KILOMETER

CLINTON COUNTY, ILLINOIS NO. 11

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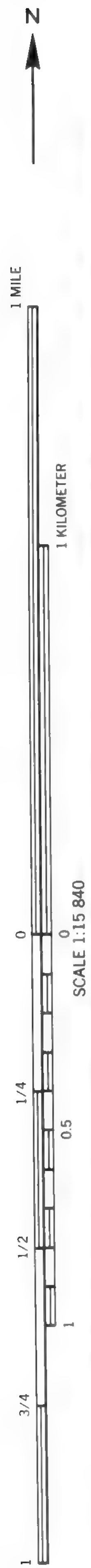
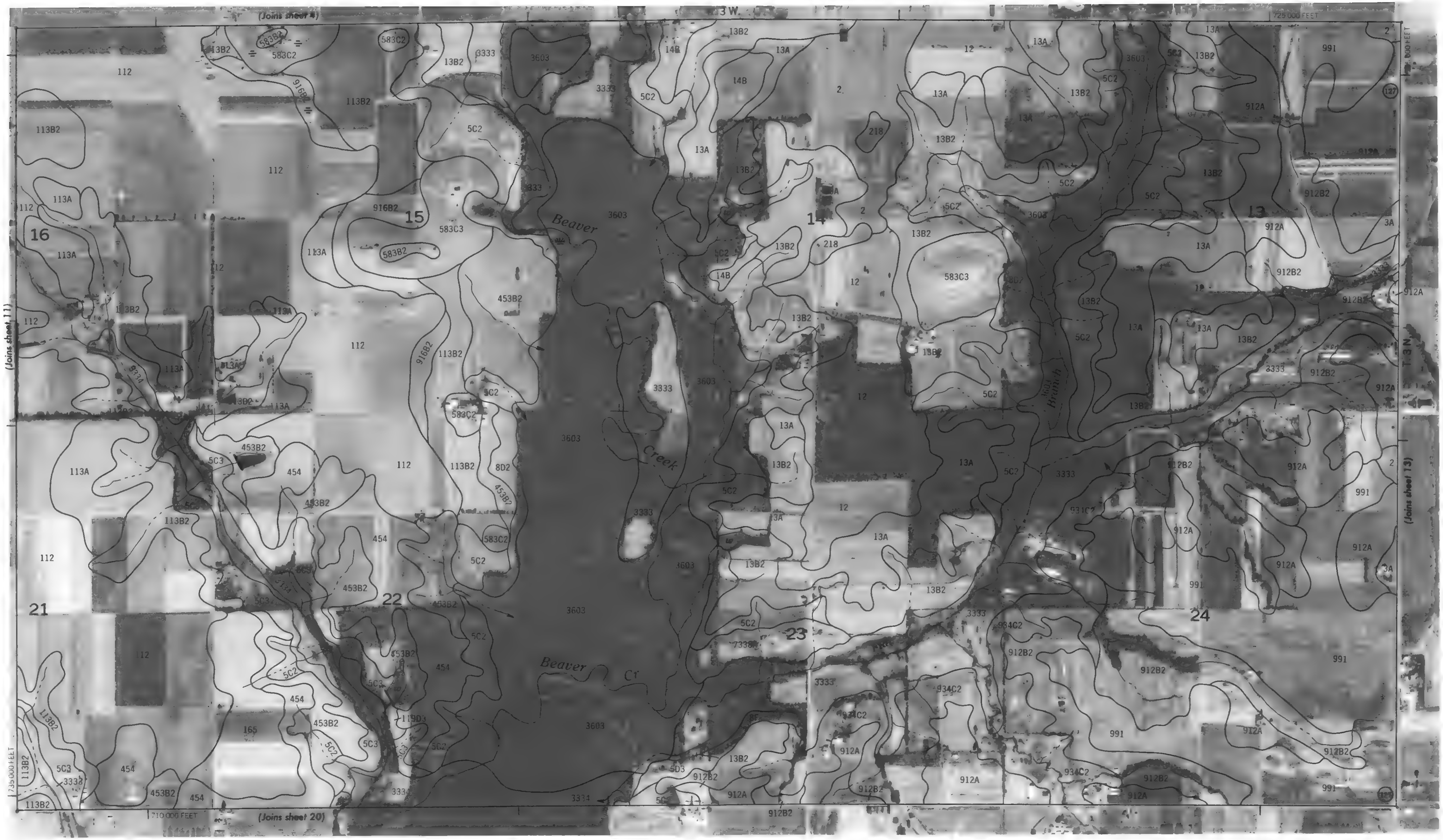
SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 12





CLINTON COUNTY, ILLINOIS NO. 12

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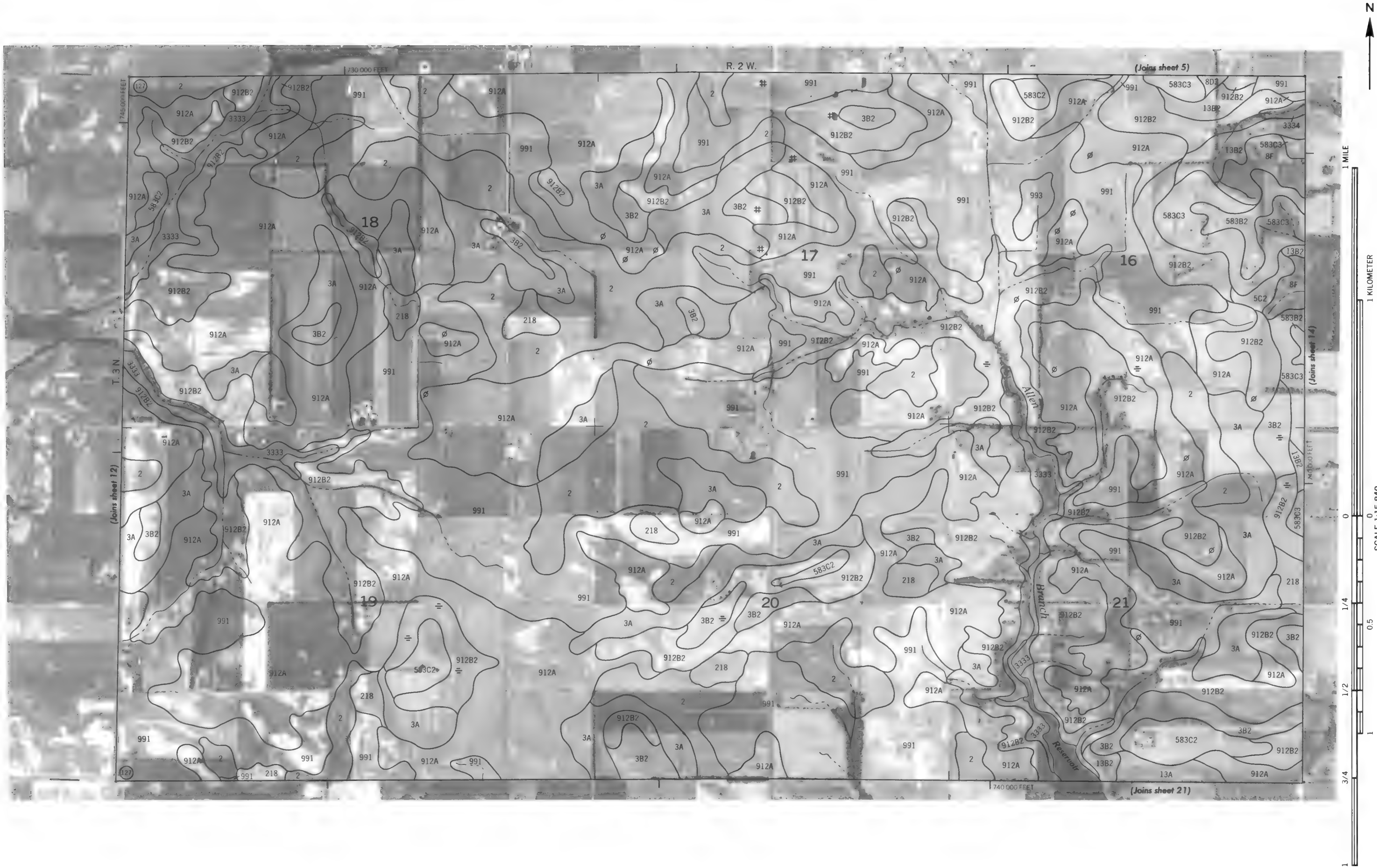
13



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CLINTON COUNTY, ILLINOIS NO. 13

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 14

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15

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CLINTON COUNTY, ILLINOIS NO. 15

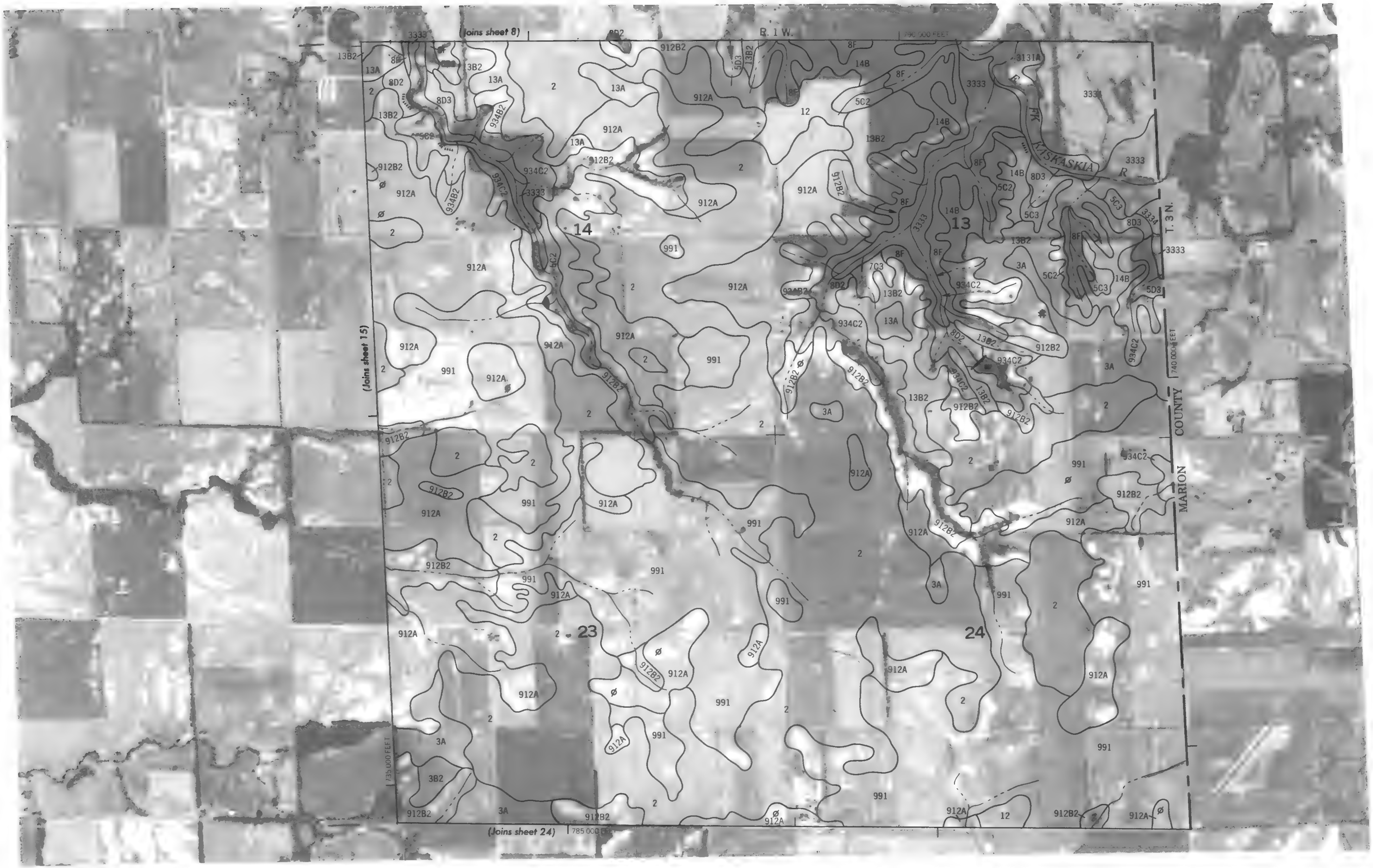
SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 16

N

1 MILE · 3/4 · 1/2 · 1/4 · 0

1 KILOMETER · 1 · 0.5 · 0

SCALE 1:15 840



CLINTON COUNTY, ILLINOIS NO. 16

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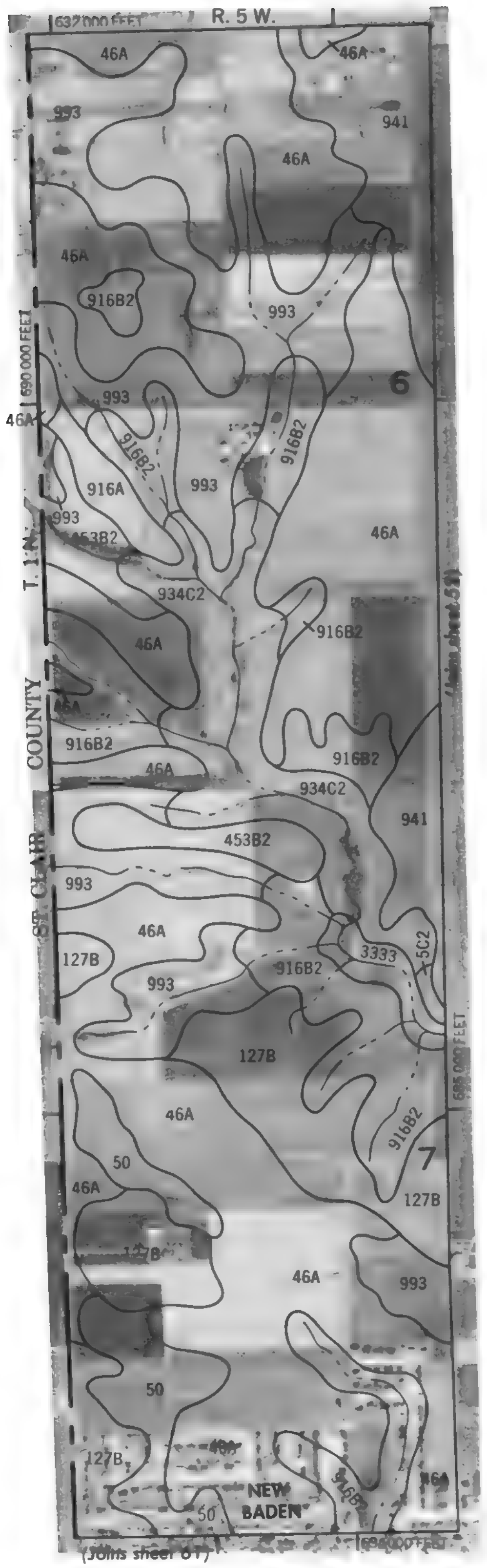
CLINTON COUNTY, ILLINOIS NO. 17

INSET B

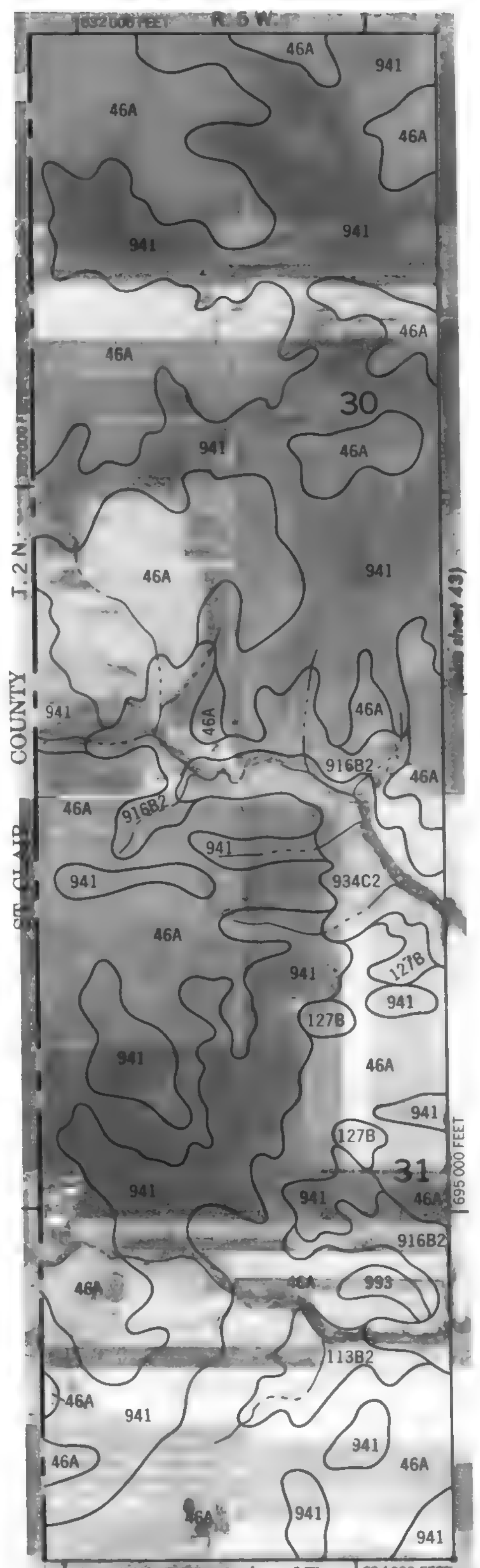
(Joins inset A, sheet 17)



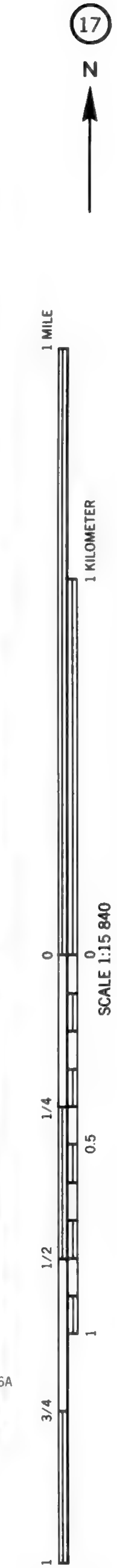
1000 - 2000 AND 5000-FOOT GRID TICKS

INSET A

(Joins inset B, sheet 9)



2000 AND 5000-FOOT GRID TICKS



SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 18

N

1 MILE

1 KILOMETER

SCALE 1:15 840

CLINTON COUNTY, ILLINOIS NO. 18

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CLINTON COUNTY, ILLINOIS NO. 19

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 2

N

SCALE 1:15 840

1 MILE

1 KILOMETER

CLINTON COUNTY, ILLINOIS NO. 2

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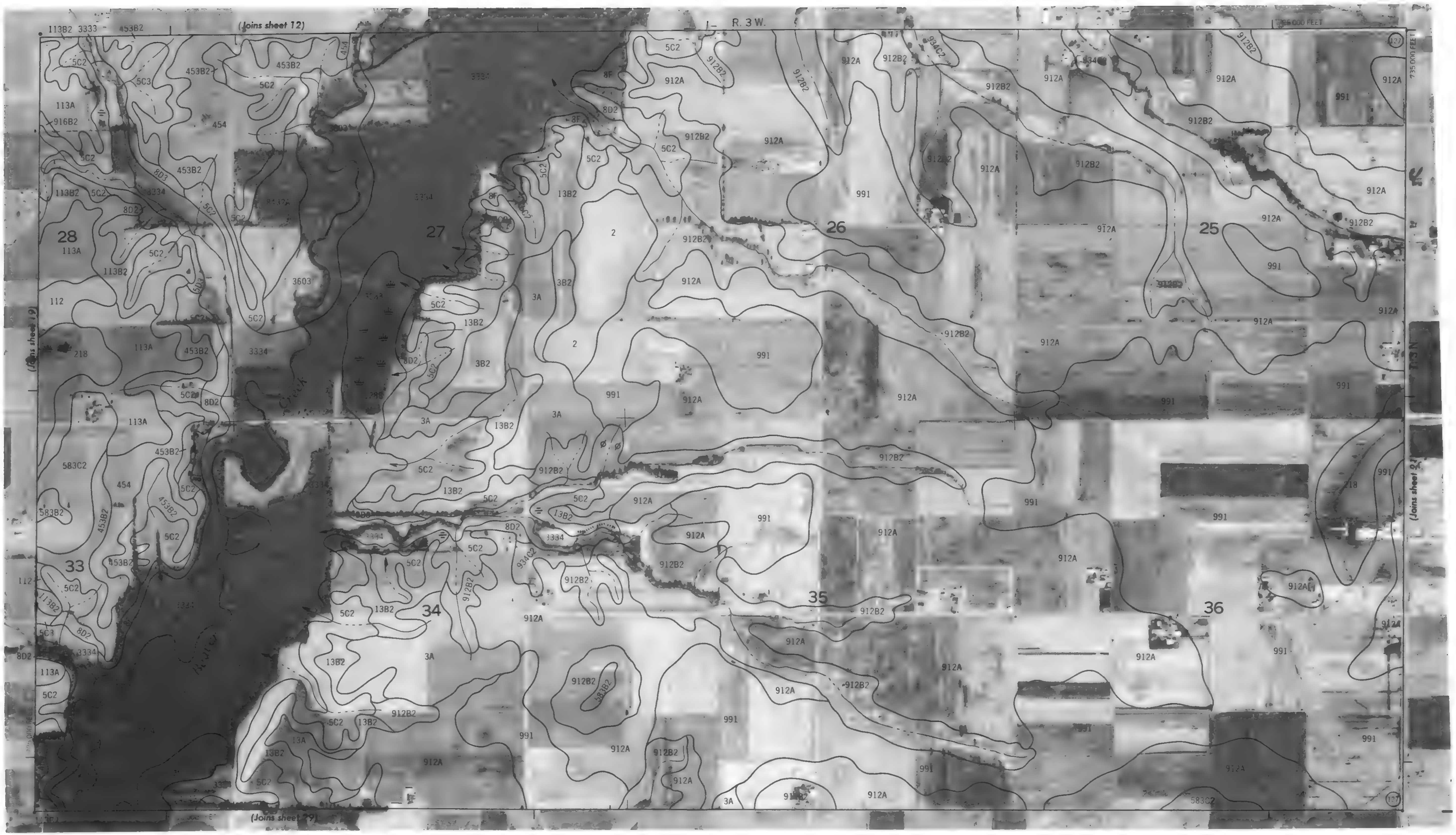
SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 20

N



1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 20

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CLINTON COUNTY, ILLINOIS NO. 21

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 22

N

1 MILE

1 KILOMETER

SCALE 1:15 840

CLINTON COUNTY, ILLINOIS NO. 22

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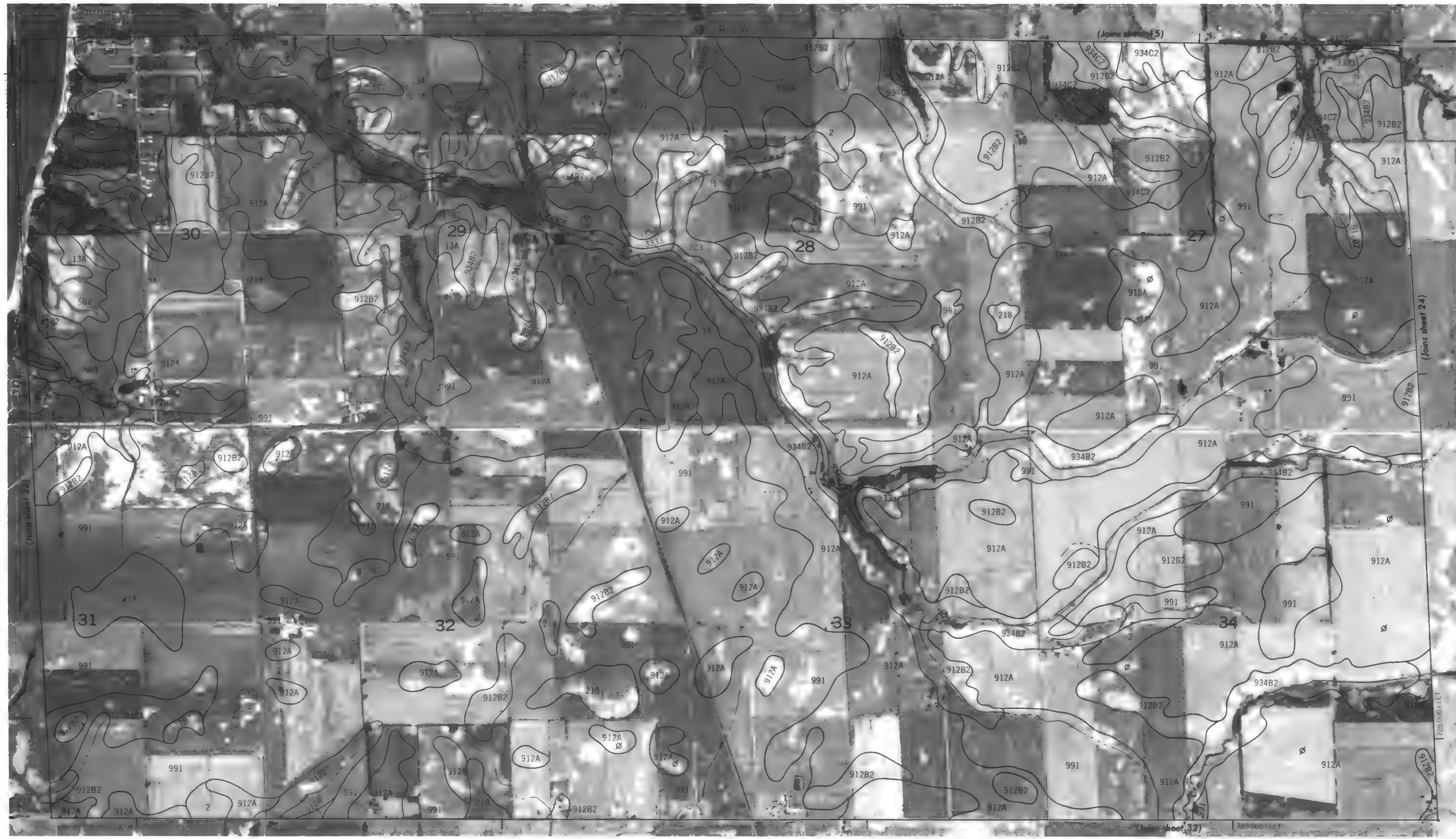
N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 23



1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

(24)

N

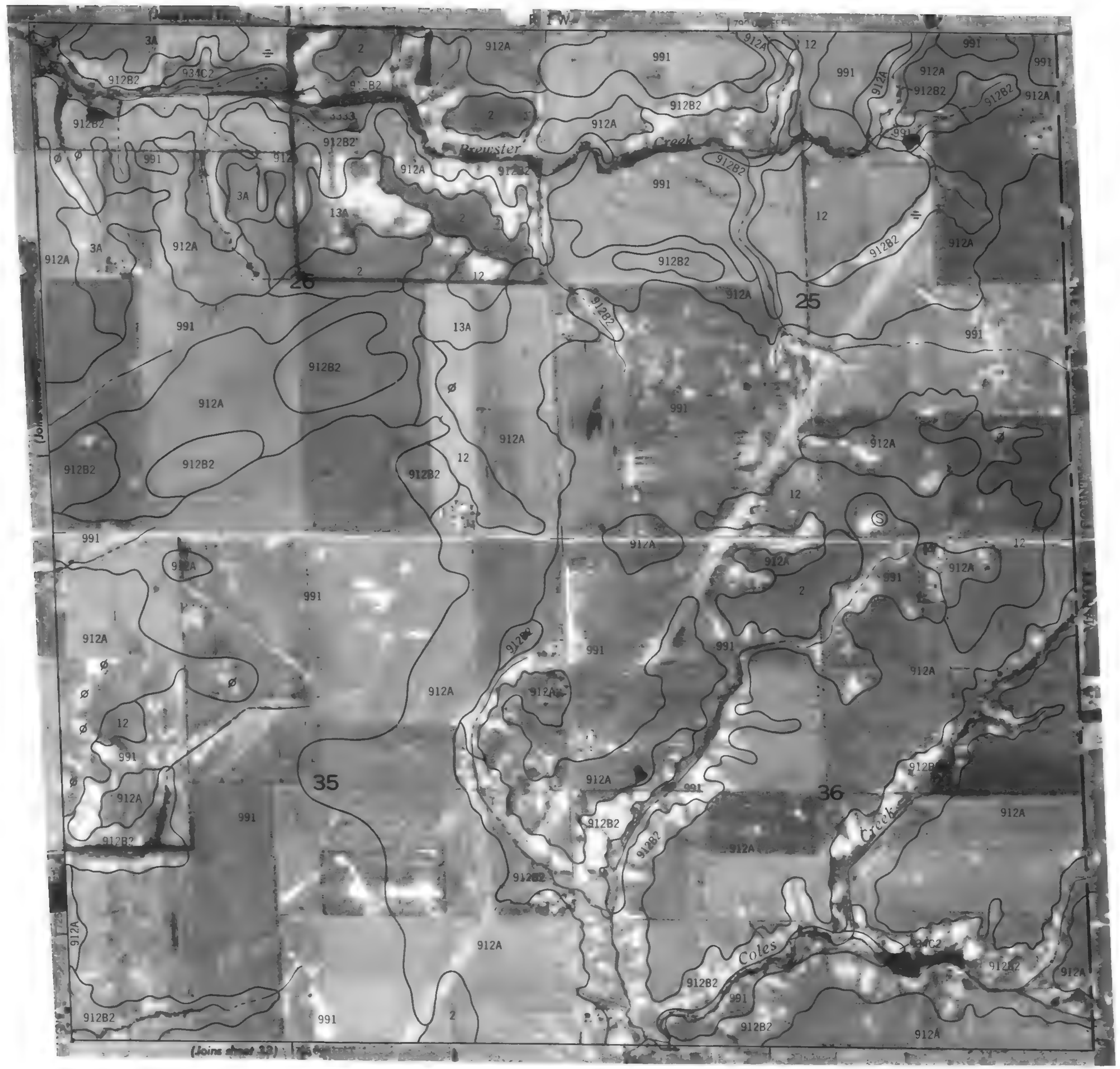
1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1



CLINTON COUNTY, ILLINOIS NO. 24

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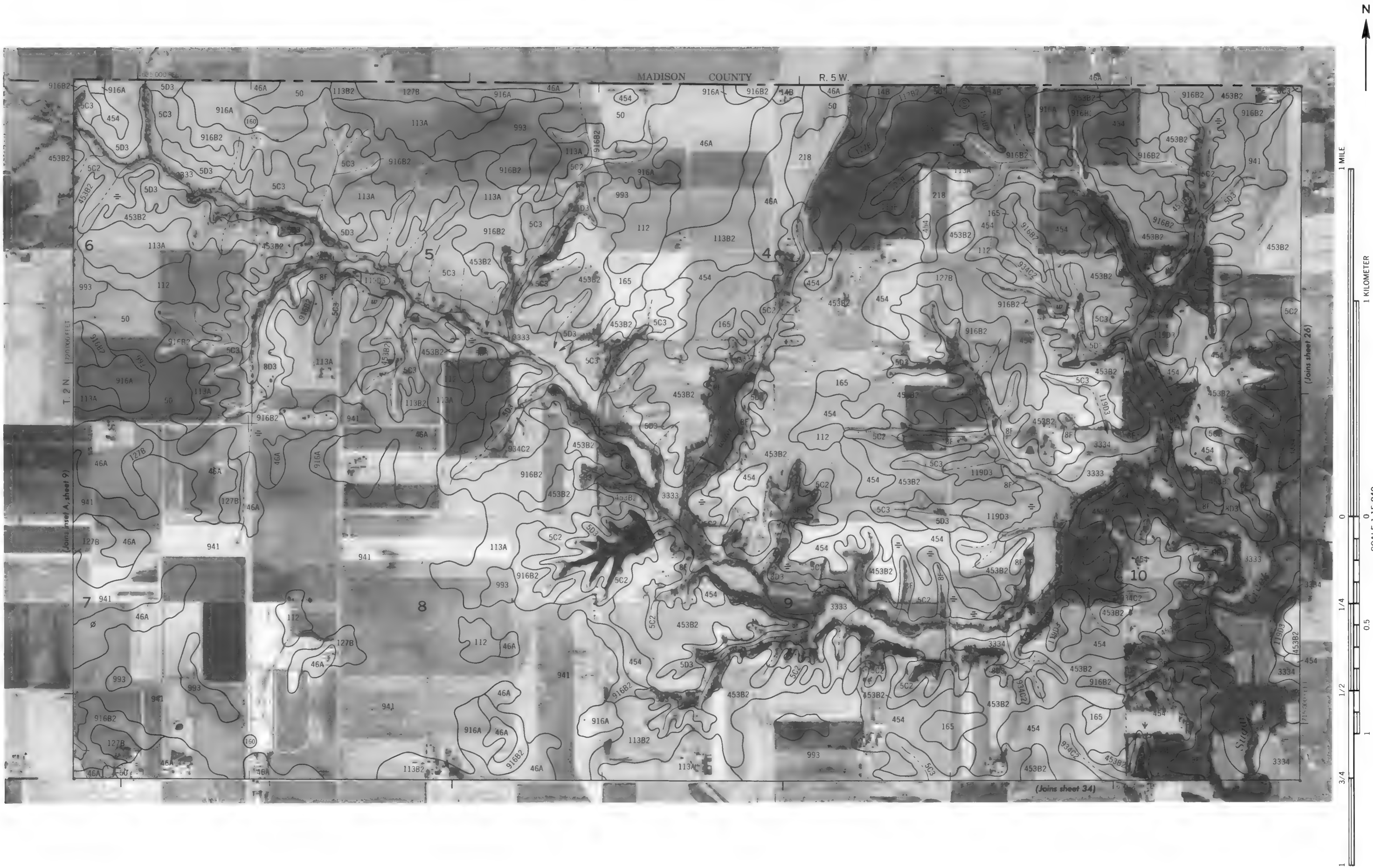
CLINTON COUNTY, ILLINOIS NO. 25



SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 26

N

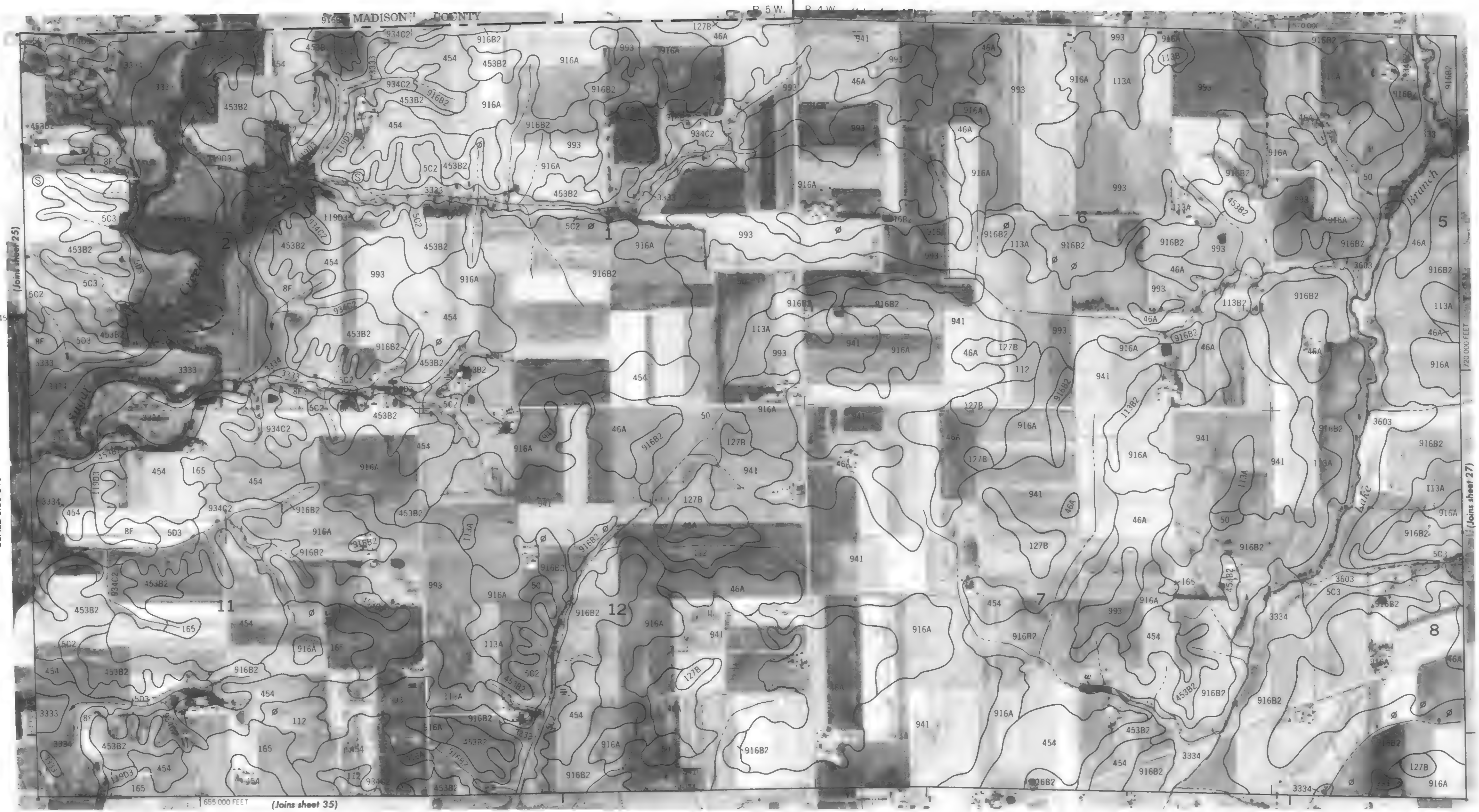
1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1



CLINTON COUNTY, ILLINOIS NO. 26

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N

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CLINTON COUNTY, ILLINOIS NO. 27

CLINTON COUNTY, ILLINOIS NO. 28

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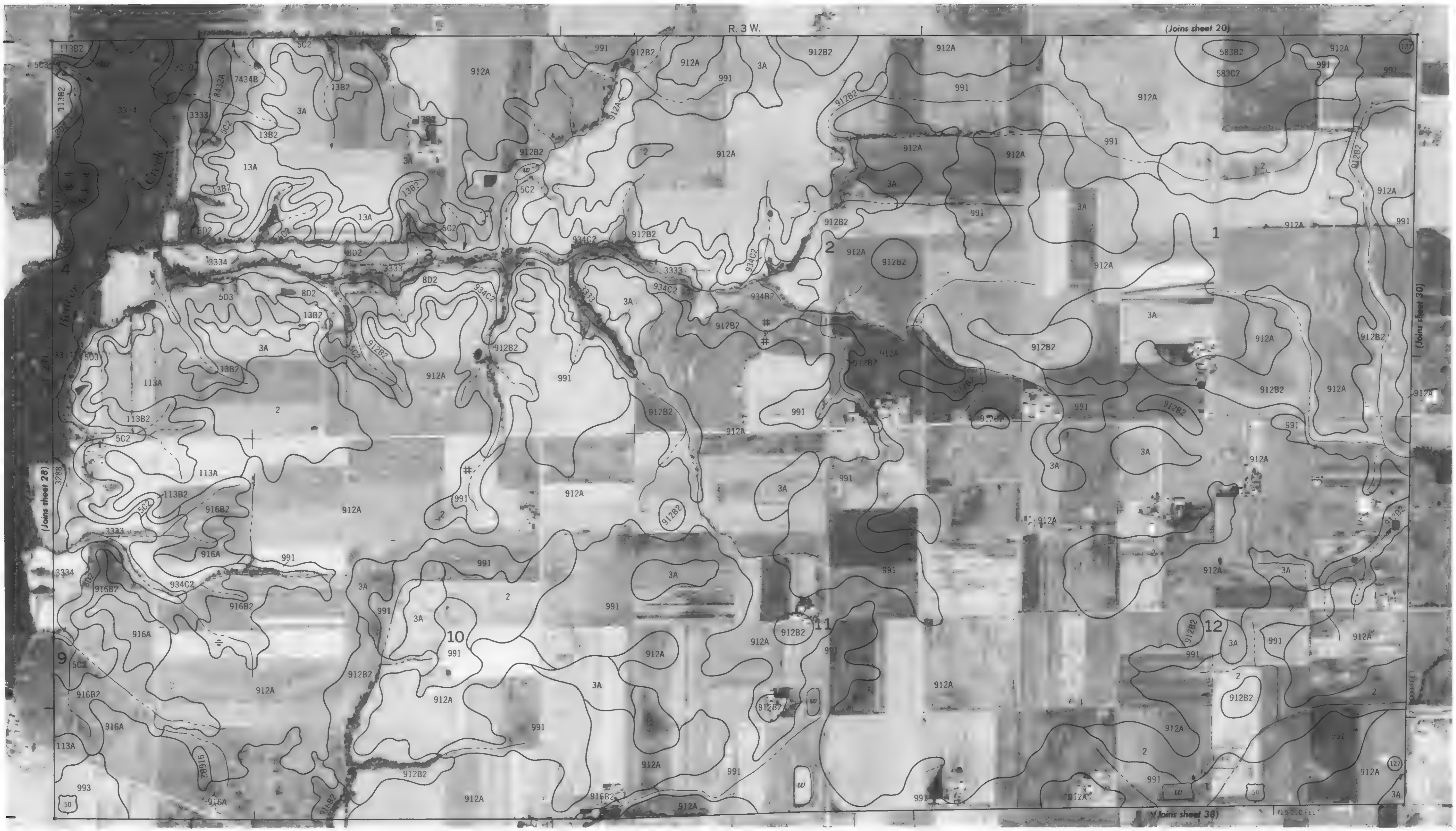
29

N



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CLINTON COUNTY, ILLINOIS NO. 29

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

N

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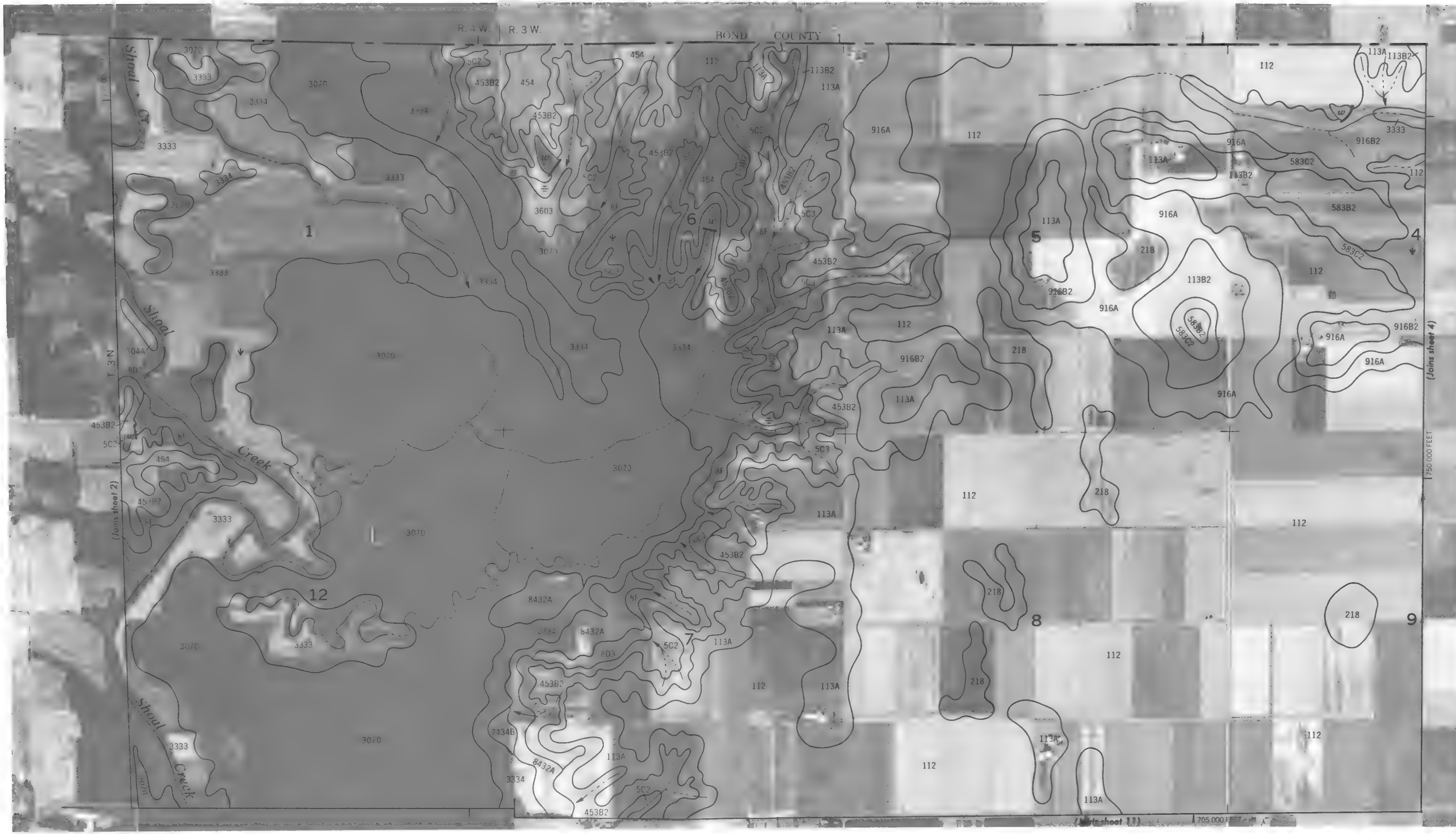
CLINTON COUNTY, ILLINOIS NO. 3



1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 30

N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 30

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

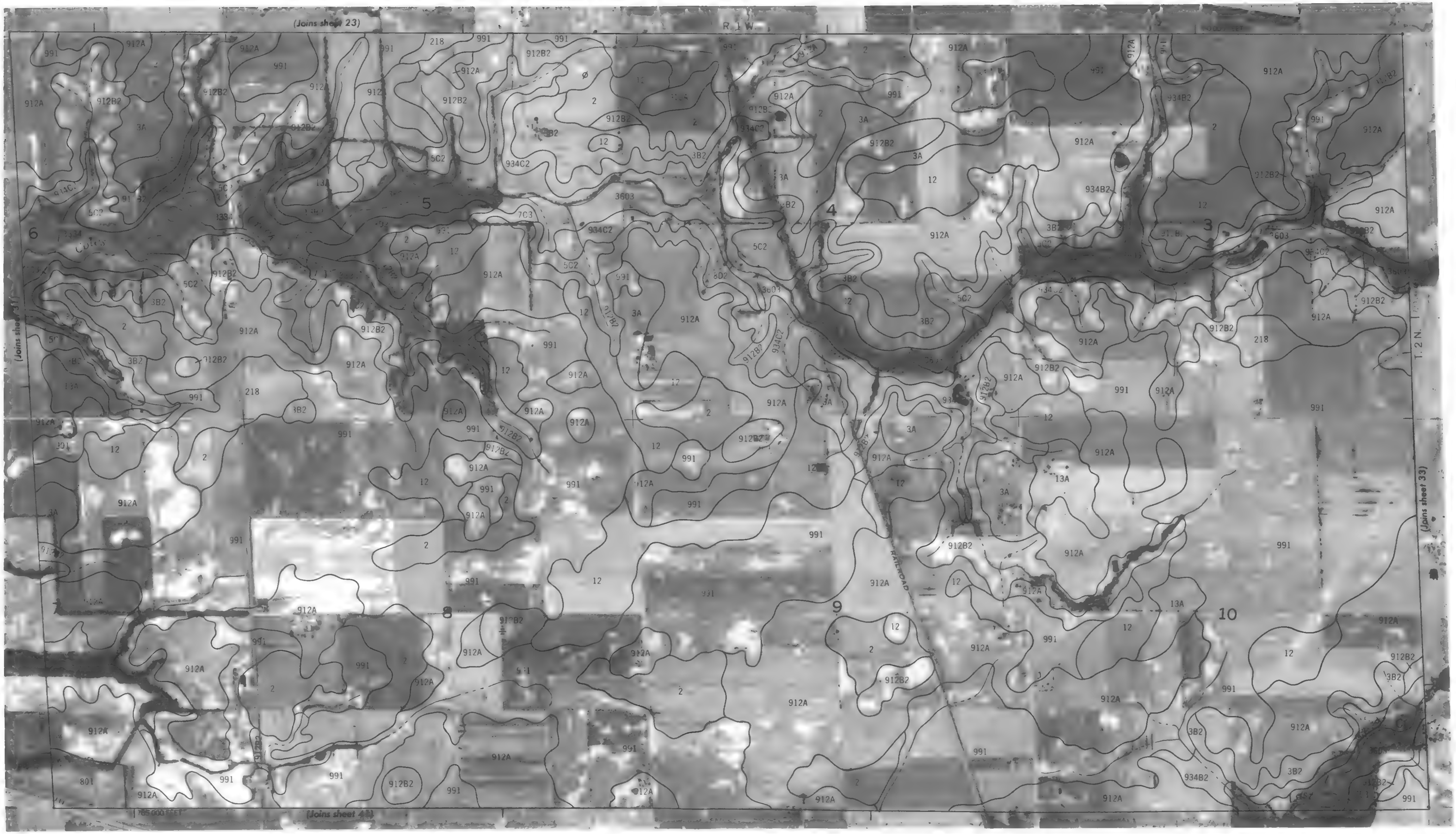
N

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

CLINTON COUNTY, ILLINOIS NO. 31

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

CLINTON COUNTY, ILLINOIS NO. 32

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 33

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 34

N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

CLINTON COUNTY, ILLINOIS NO. 34

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

35

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 35

1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 36

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
0.5
1/2
1
3/4
1

CLINTON COUNTY, ILLINOIS NO. 36

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 37

N

1 MILE

1 KILOMETER

SCALE 1:15 840

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 38

N

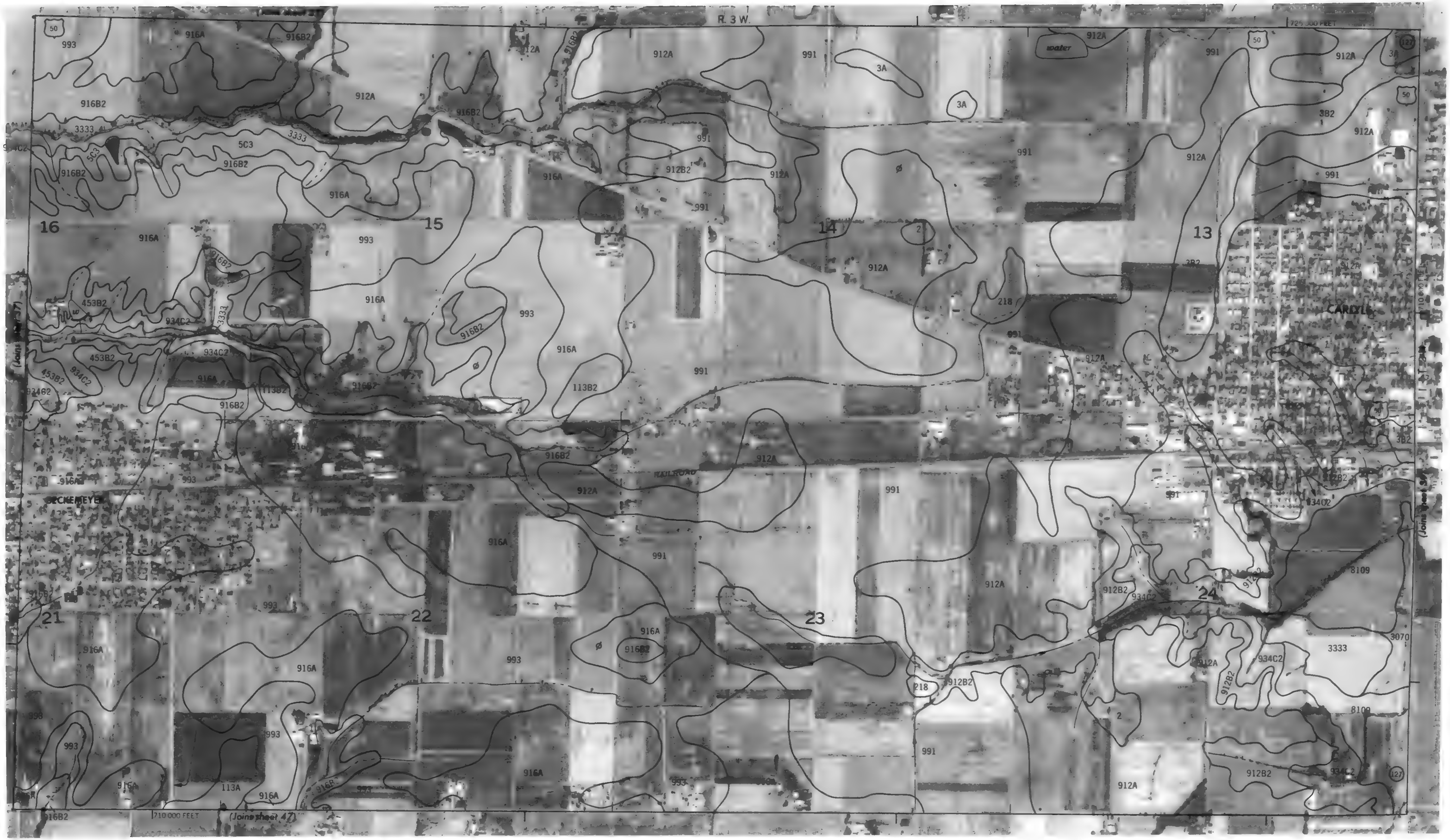
1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1



CLINTON COUNTY, ILLINOIS NO. 38

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

SCALE 1:15 840

1 MILE 3/4 1/2 1/4 0

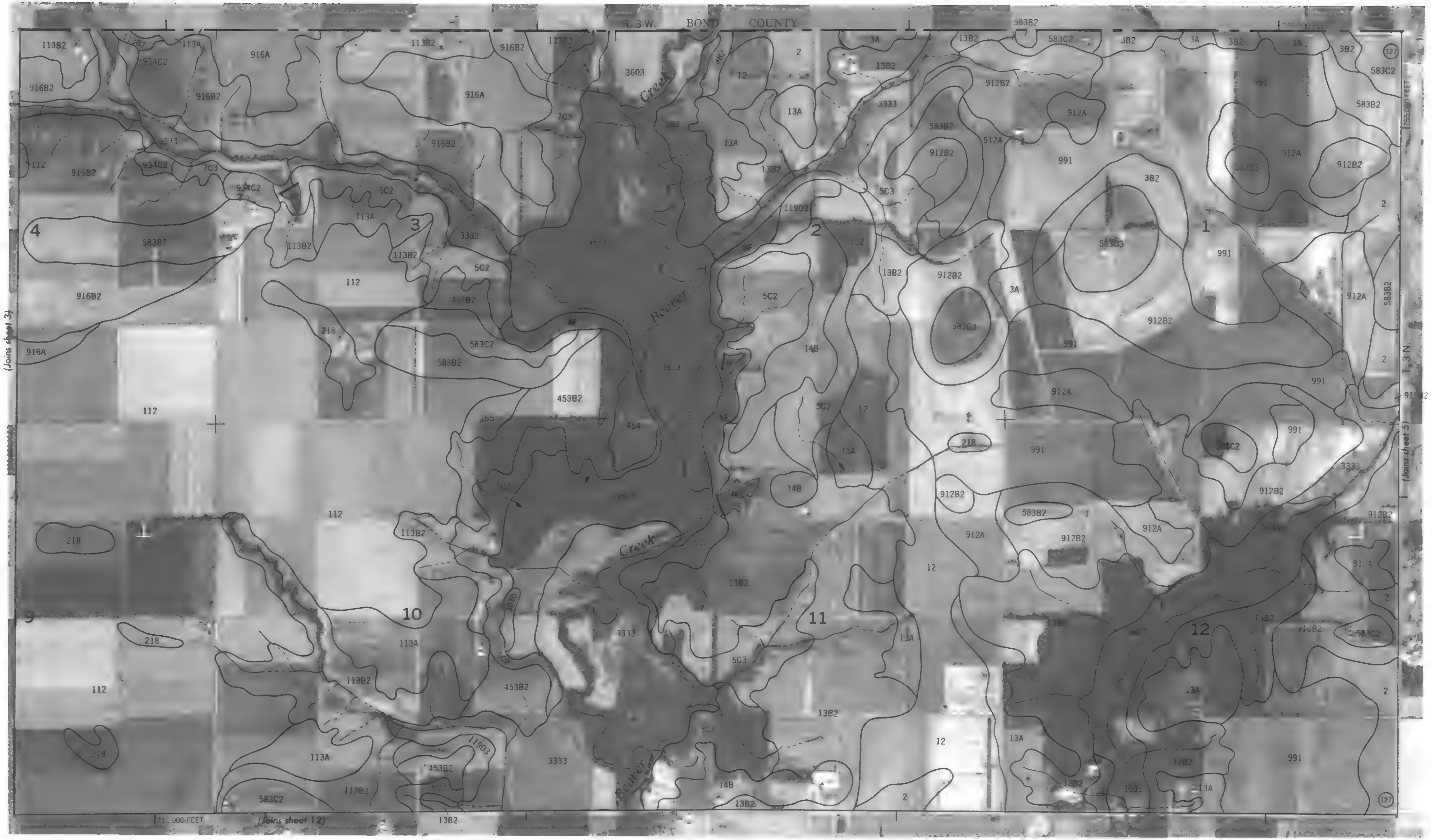
1 KILOMETER 0.5 0

CLINTON COUNTY, ILLINOIS NO. 39

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 4

N

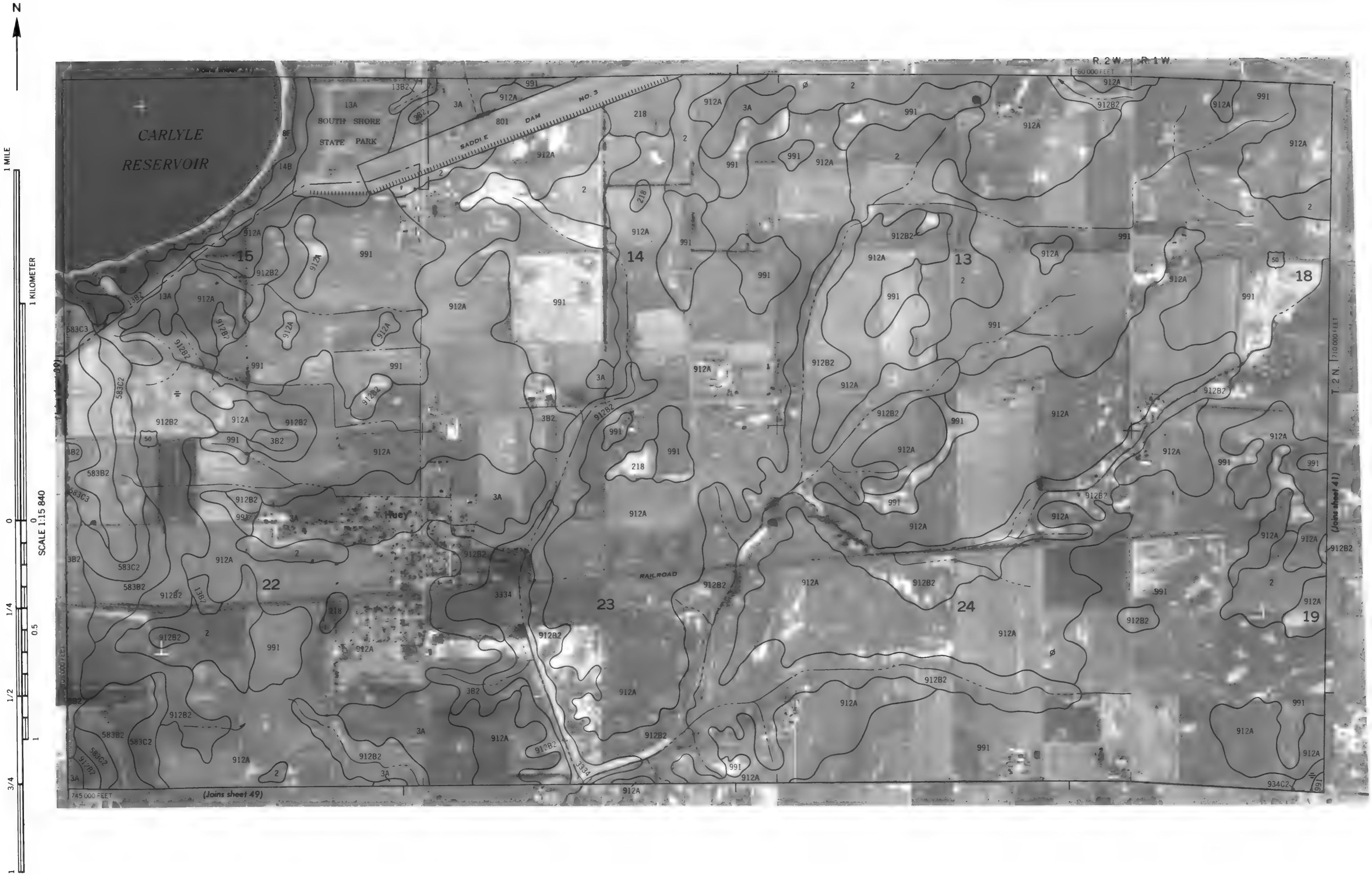


1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
0.5
1/2
1
3/4
1

CLINTON COUNTY, ILLINOIS NO. 4

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 40



CLINTON COUNTY, ILLINOIS NO. 40

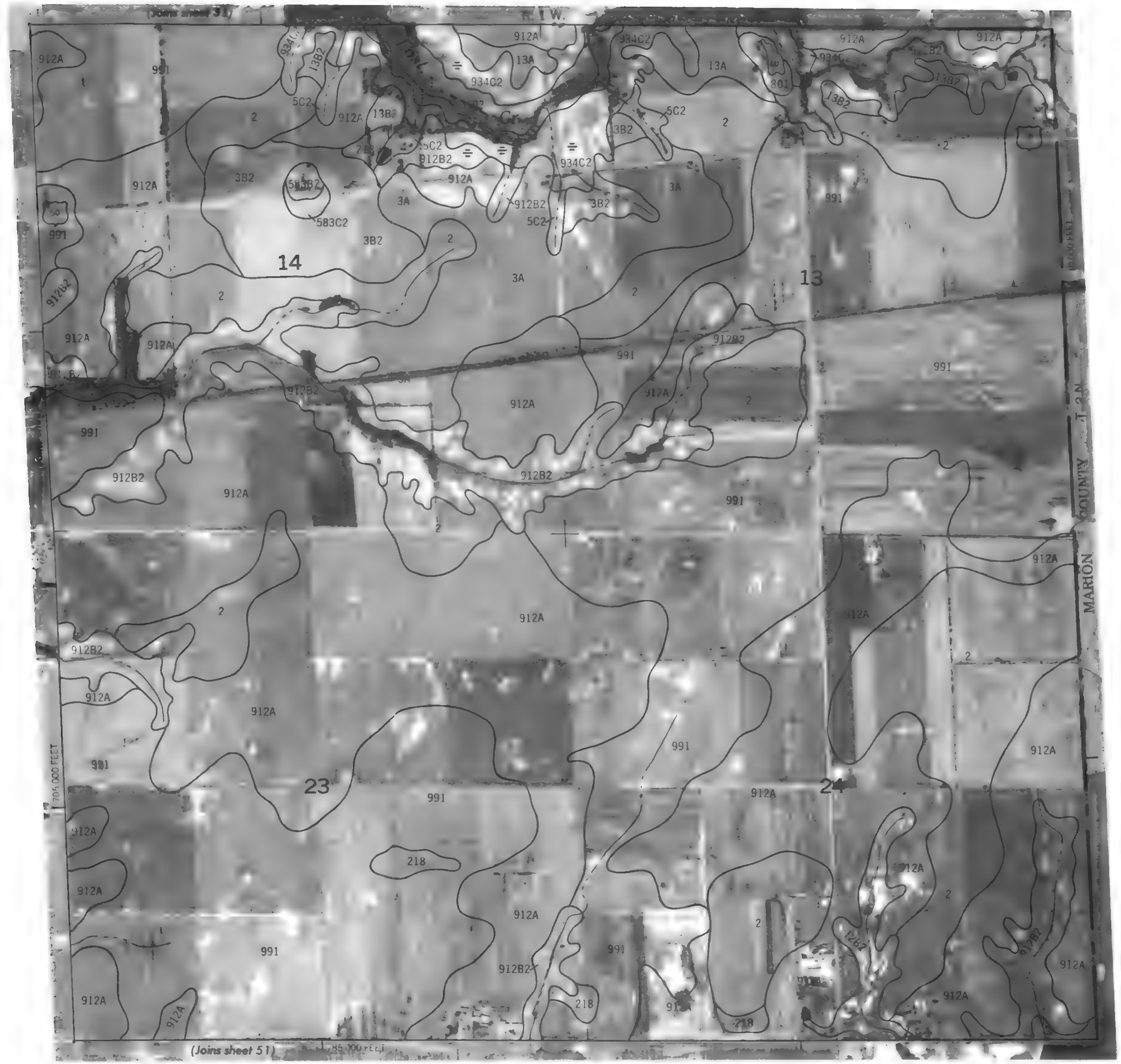
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 41

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 42

N



1 MILE

1 KILOMETER

SCALE 1:15 840

0

1/4

1/2

3/4

1

0

0.5

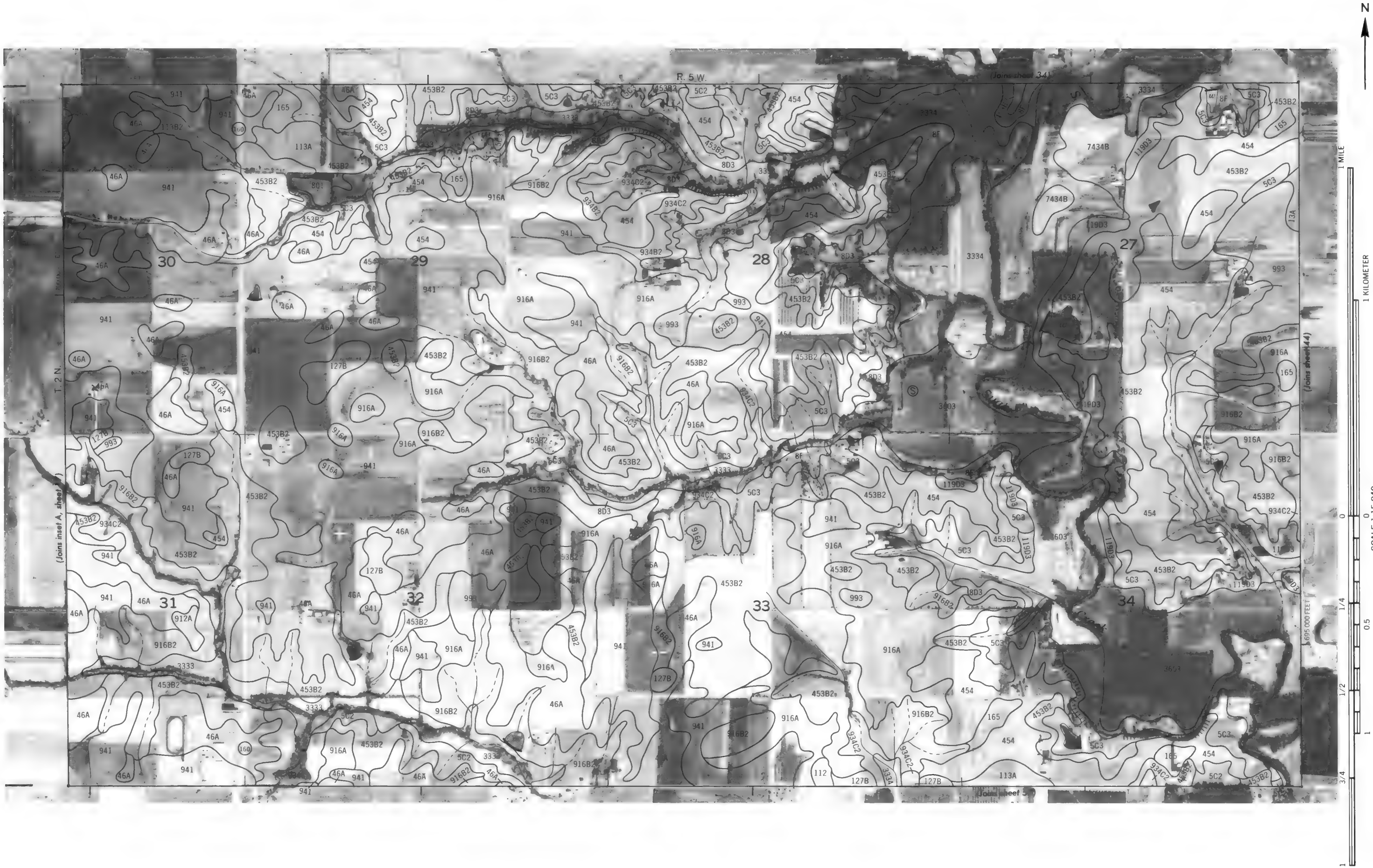
1

CLINTON COUNTY, ILLINOIS NO. 42

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 43



N

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 44

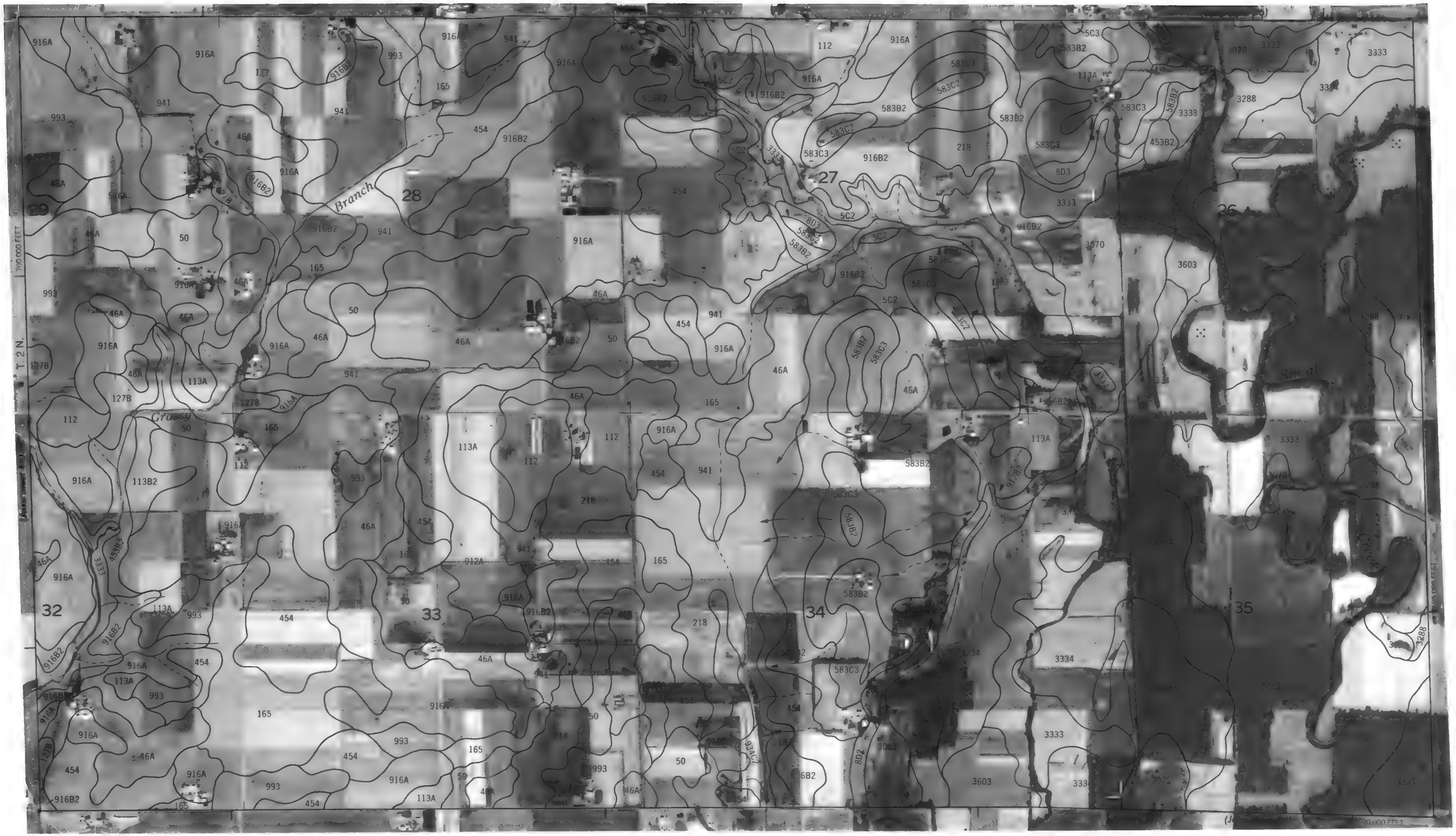
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

45

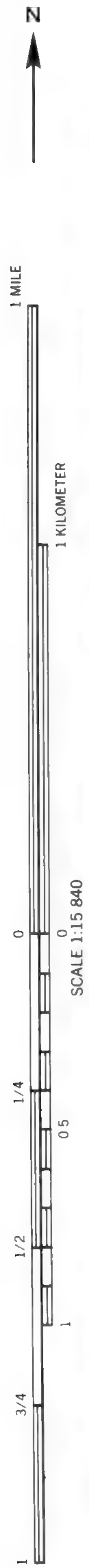
N

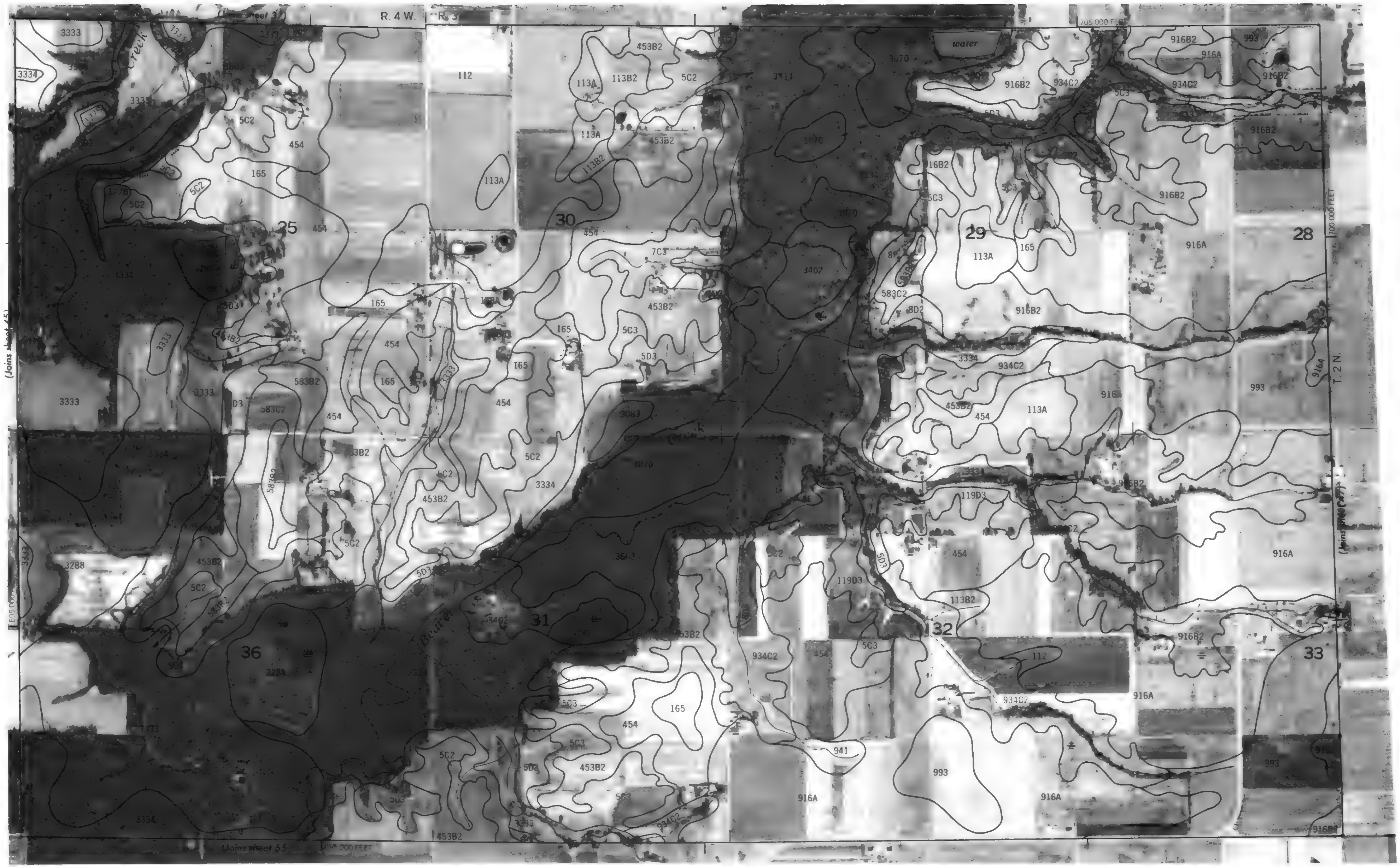
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 45



1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
0.5
1/2
1
3/4
1





CLINTON COUNTY, ILLINOIS NO. 46

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981-1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 , 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 47

CLINTON COUNTY, ILLINOIS NO. 48

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 49

SCALE 1:15 840

1 MILE

3/4

1/2

1/4

0

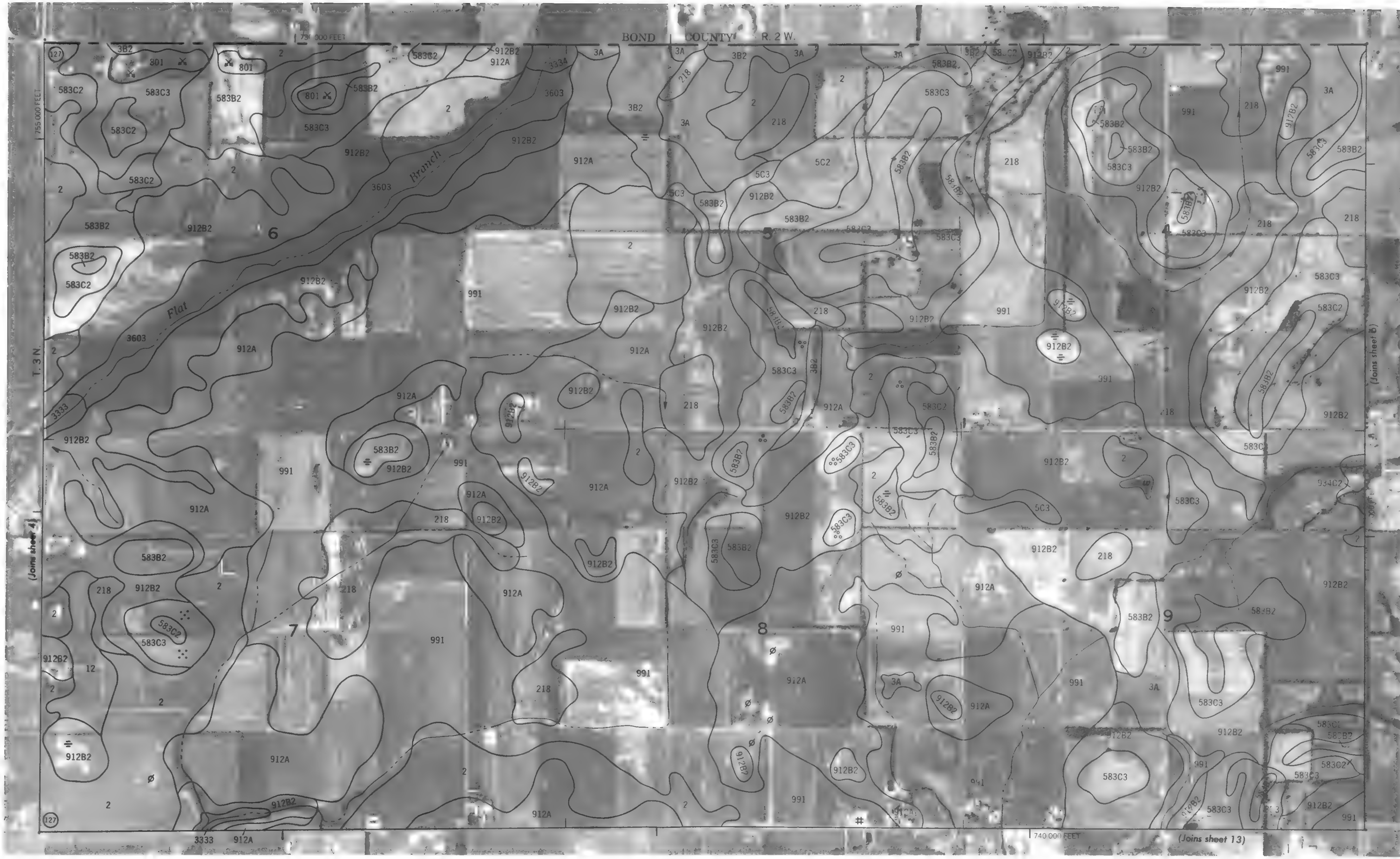
1 KILOMETER

0.5

0

1

N



1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
1
SCALE 1:15 840

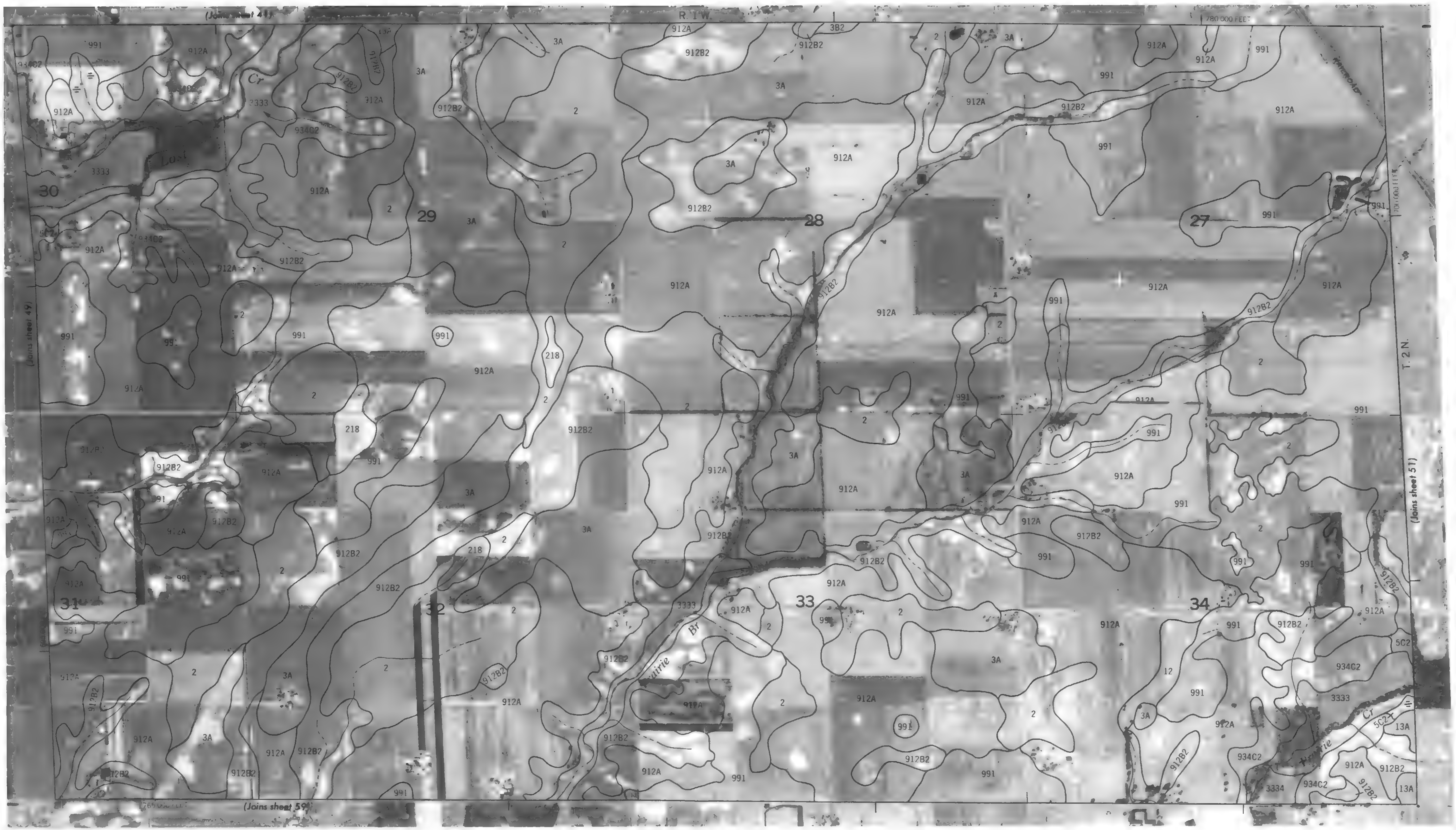
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 5

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 50

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
0.5
1/2
1
3/4
1



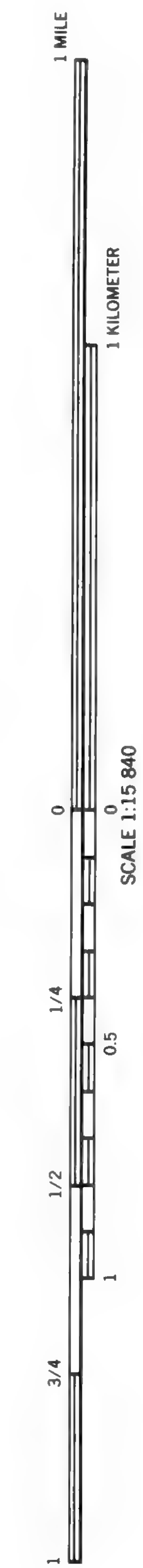
CLINTON COUNTY, ILLINOIS NO. 50

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

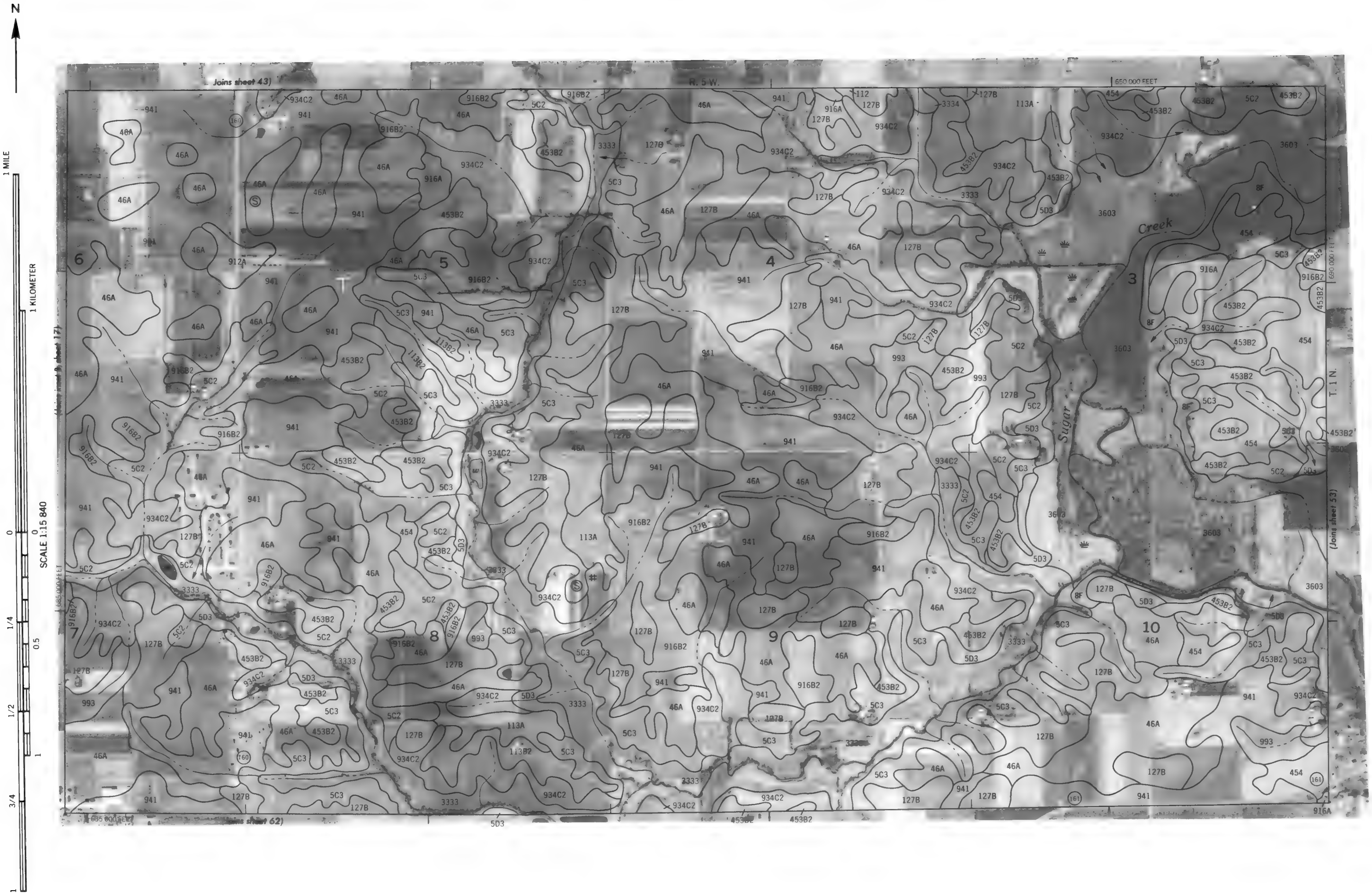
N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 51



SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 52



CLINTON COUNTY, ILLINOIS NO. 52

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 54

CLINTON COUNTY, ILLINOIS NO. 54

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 55

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 56

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

CLINTON COUNTY, ILLINOIS NO. 56

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 · 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 57

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

CLINTON COUNTY, ILLINOIS NO. 58

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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CLINTON COUNTY, ILLINOIS NO. 59

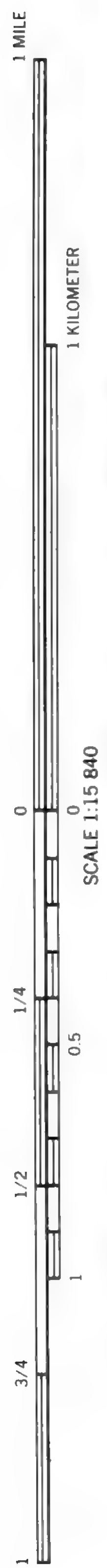
SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 6

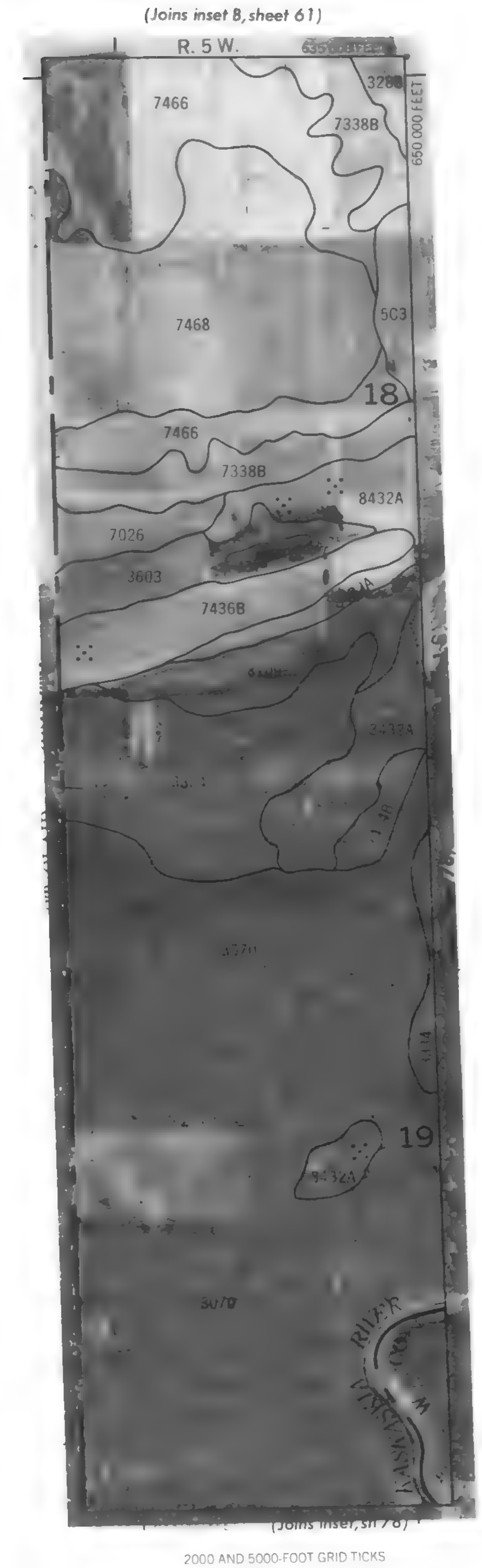
CLINTON COUNTY, ILLINOIS NO. 6

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 60





CLINTON COUNTY, ILLINOIS NO. 60

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

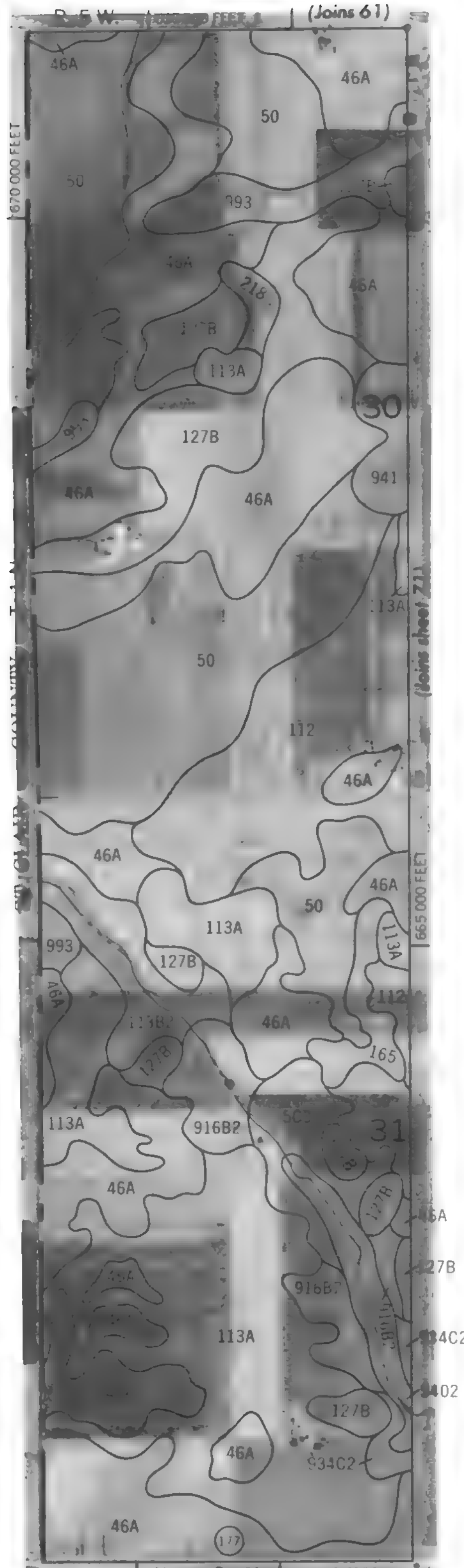
61

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

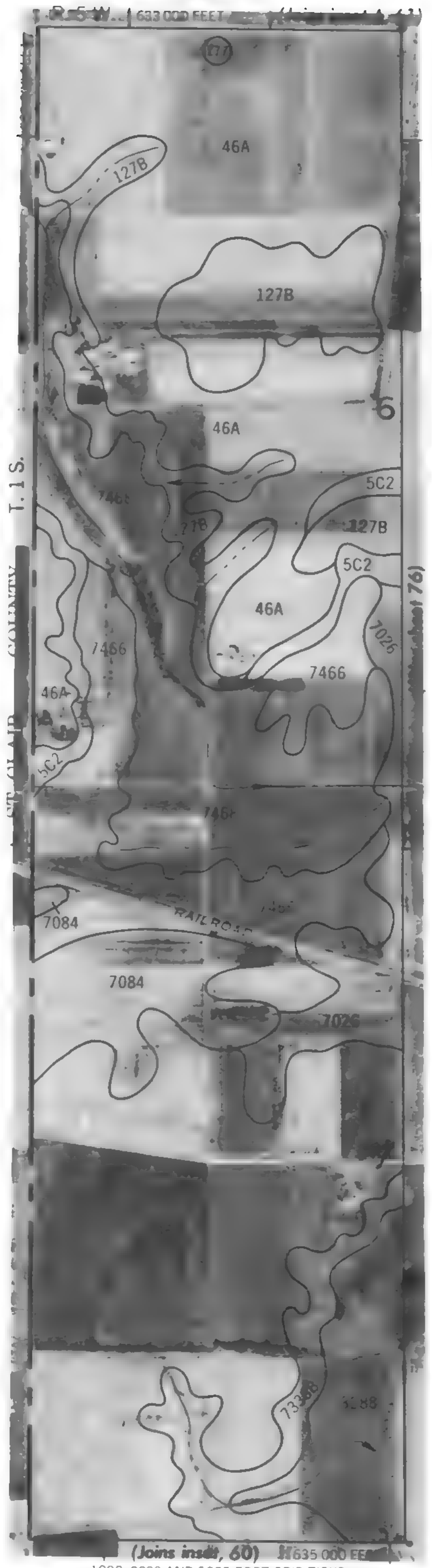
CLINTON COUNTY, ILLINOIS NO. 61

INSET A



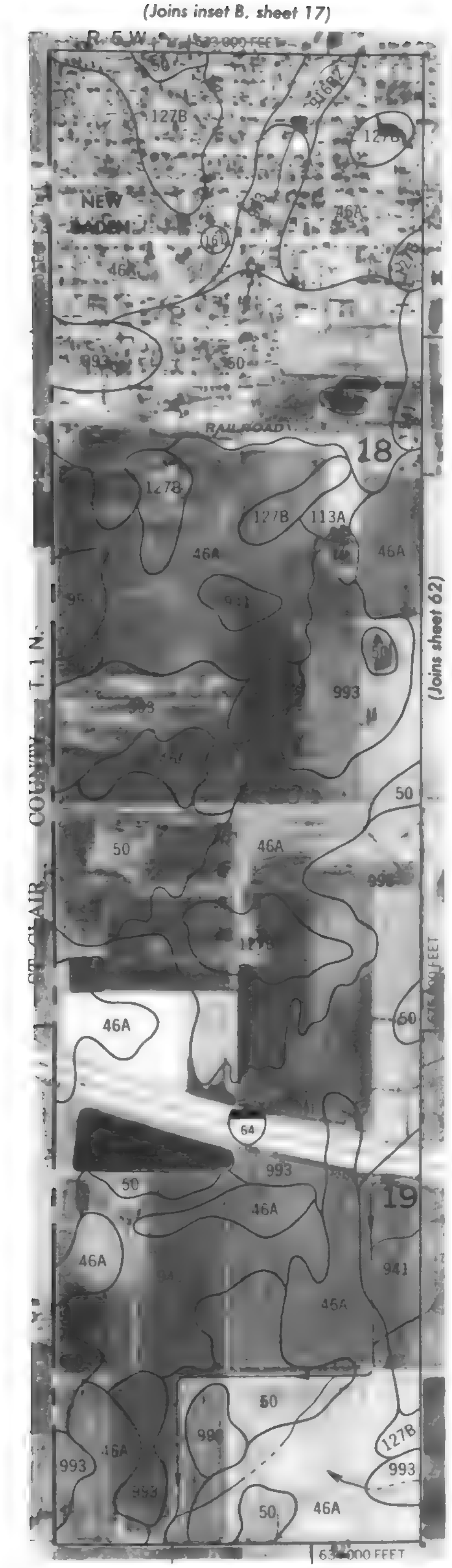
1000 AND 5000-FOOT GRID TICKS

INSET B



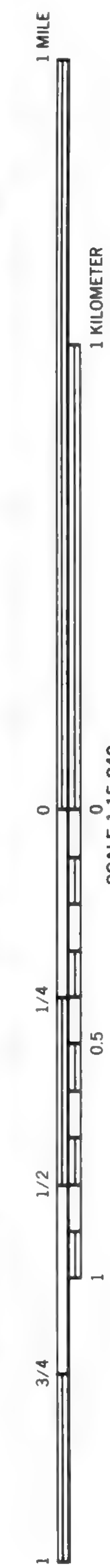
1000, 2000 AND 5000-FOOT GRID TICKS

(Joins inset B, sheet 17)

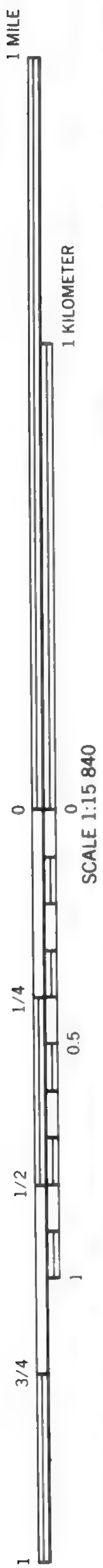


(Joins inset A, sheet 61)

1000 AND 5000-FOOT GRID TICKS



N



CLINTON COUNTY, ILLINOIS NO. 62

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:15 840

1 MILE

1 KILOMETER

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 64

N

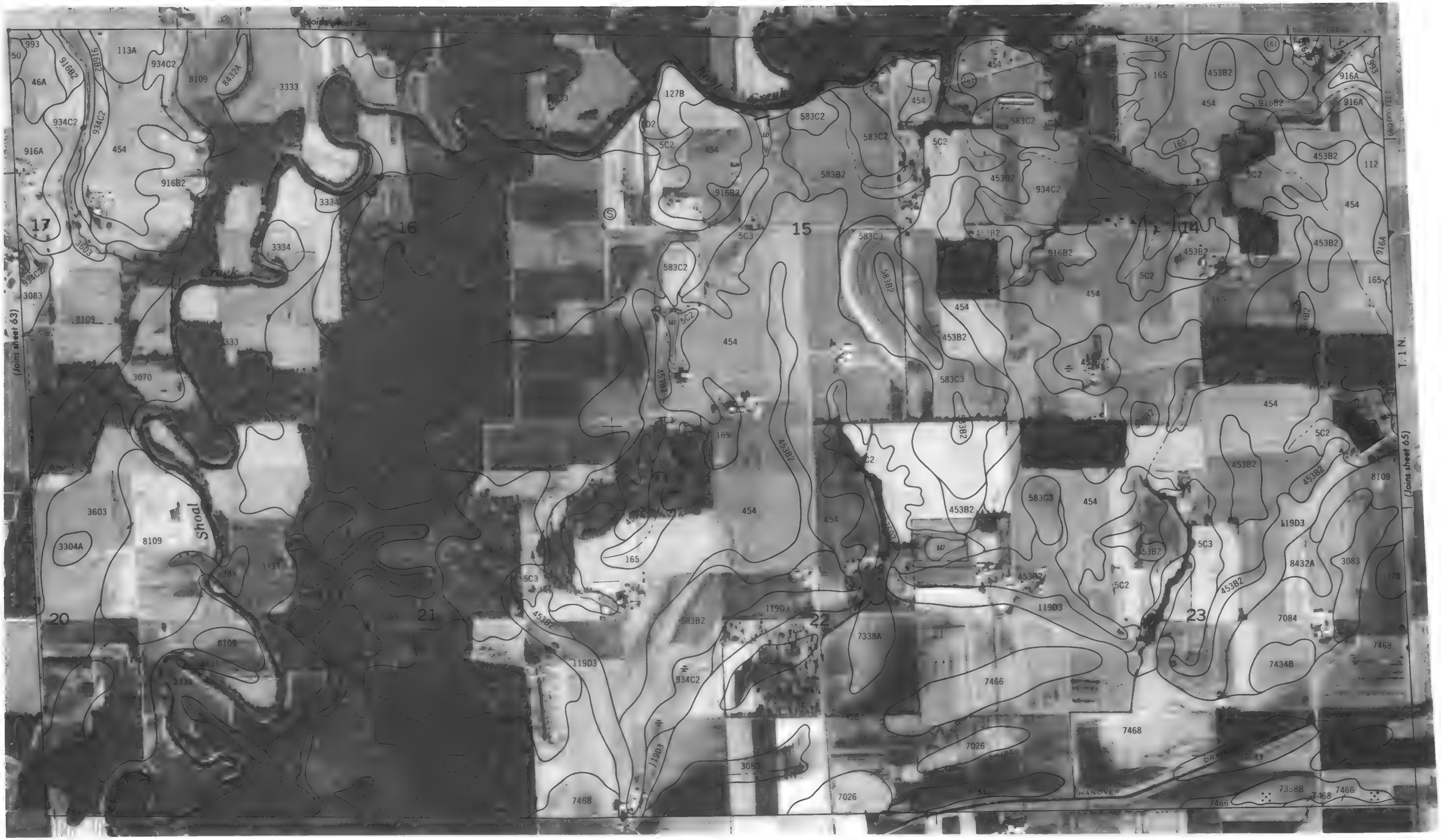
1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1



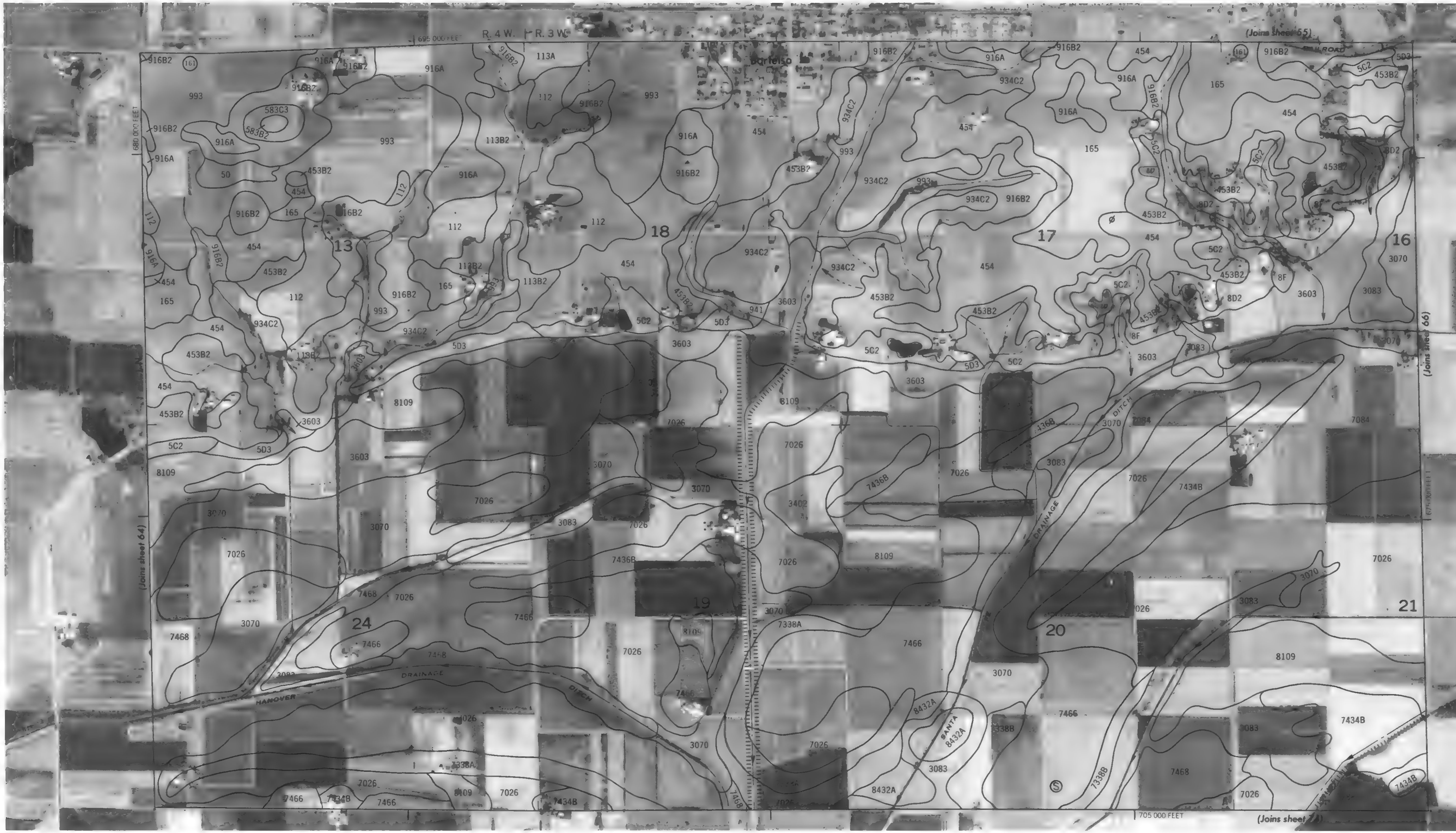
CLINTON COUNTY, ILLINOIS NO. 64

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

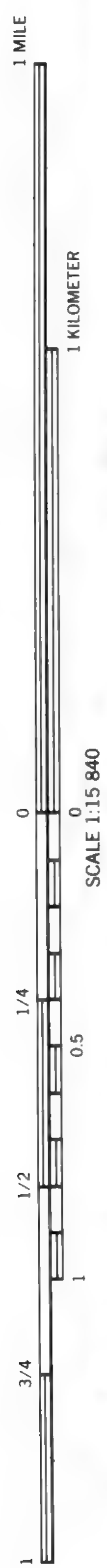
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

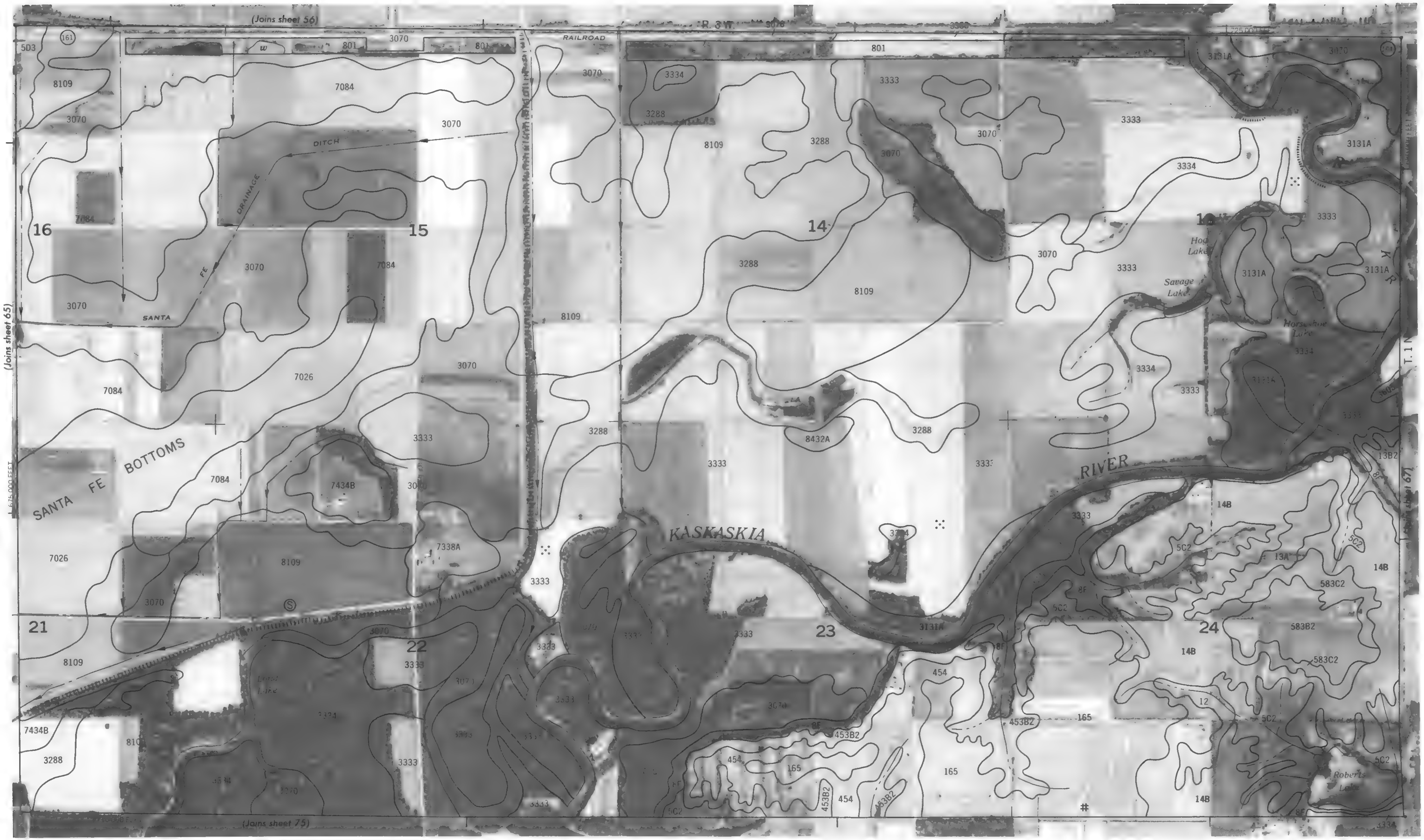
CLINTON COUNTY, ILLINOIS NO. 65



1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

N





CLINTON COUNTY, ILLINOIS NO. 66

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 67

1 MILE

1 KILOMETER

SCALE 1:15 840

0

1/4

0.5

1/2

3/4

1

CLINTON COUNTY, ILLINOIS NO. 68

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

CLINTON COUNTY, ILLINOIS NO. 69

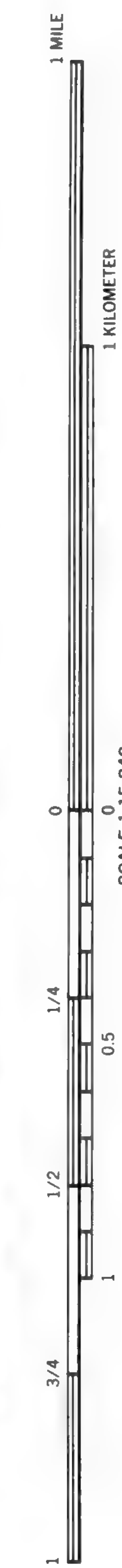
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

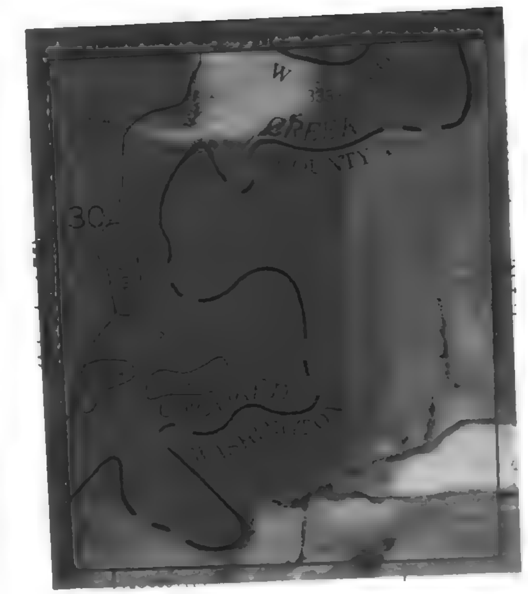
CLINTON COUNTY, ILLINOIS NO. 7

N



N

SCALE 1:15 840
1 MILE 0 1/4 1/2 3/4 1
1 KILOMETER 0 0.5 1



2000 AND 5000-FOOT GRID TICKS

CLINTON COUNTY, ILLINOIS NO. 70

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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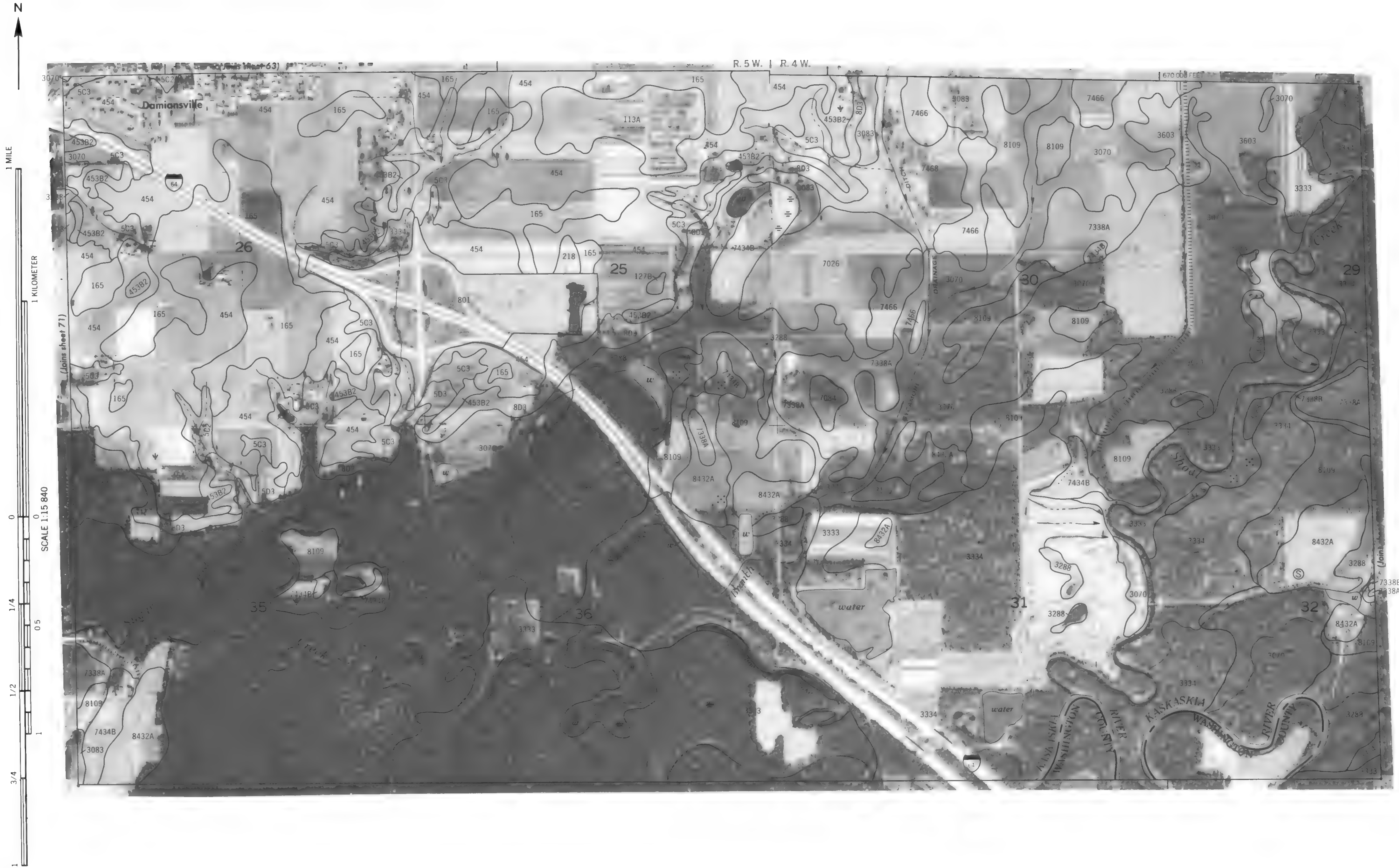
CLINTON COUNTY, ILLINOIS NO. 71

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 72



CLINTON COUNTY, ILLINOIS NO. 72

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 73

1 MILE
1 KILOMETER
0
1/4
1/2
3/4
1
0
0.5
1
SCALE 1:15 840

SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 74

N

1 MILE

1 KILOMETER

SCALE 1:15 840

CLINTON COUNTY, ILLINOIS NO. 74

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

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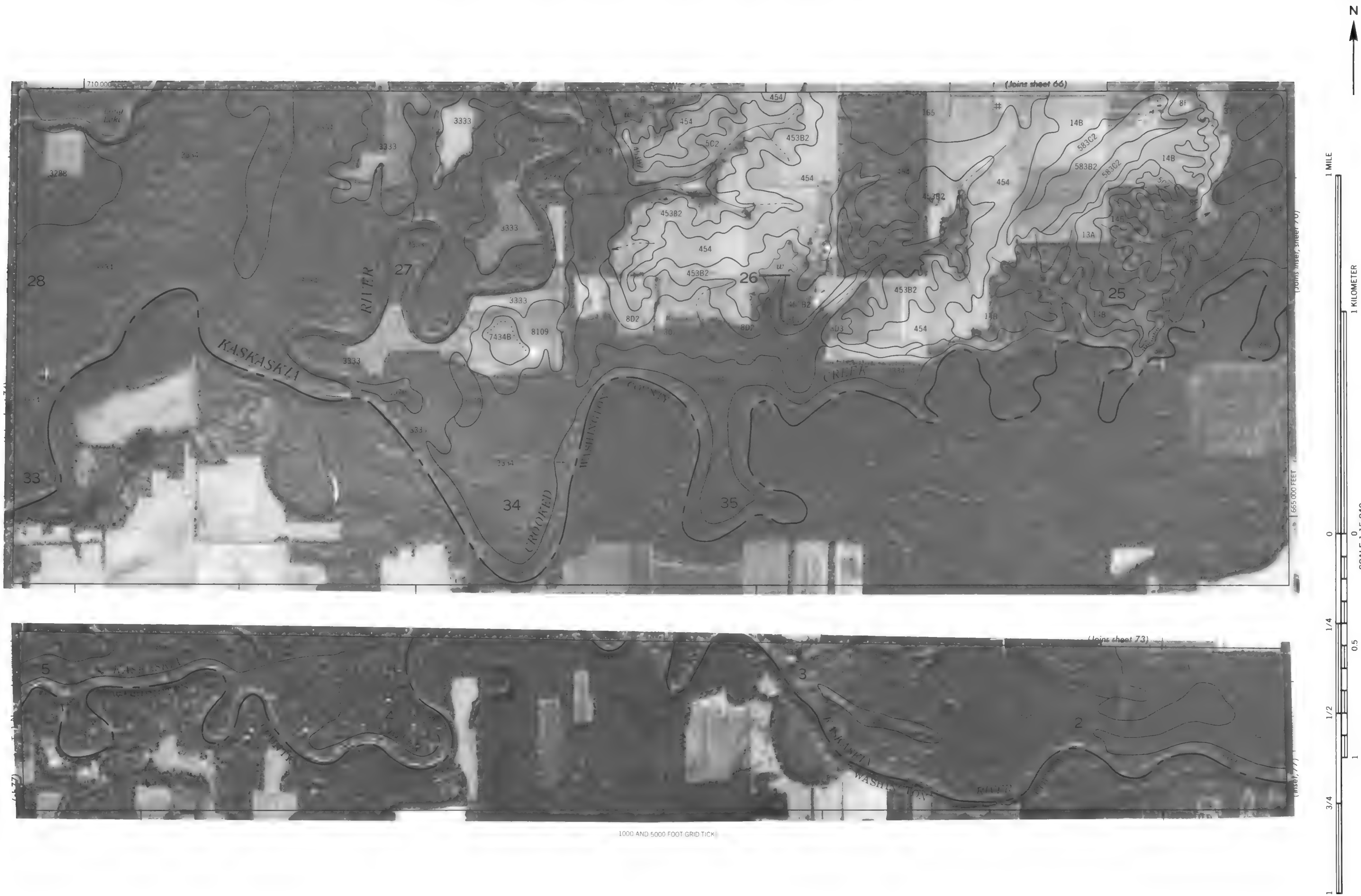
CLINTON COUNTY, ILLINOIS NO. 75



SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 76

N

1 MILE

1 KILOMETER

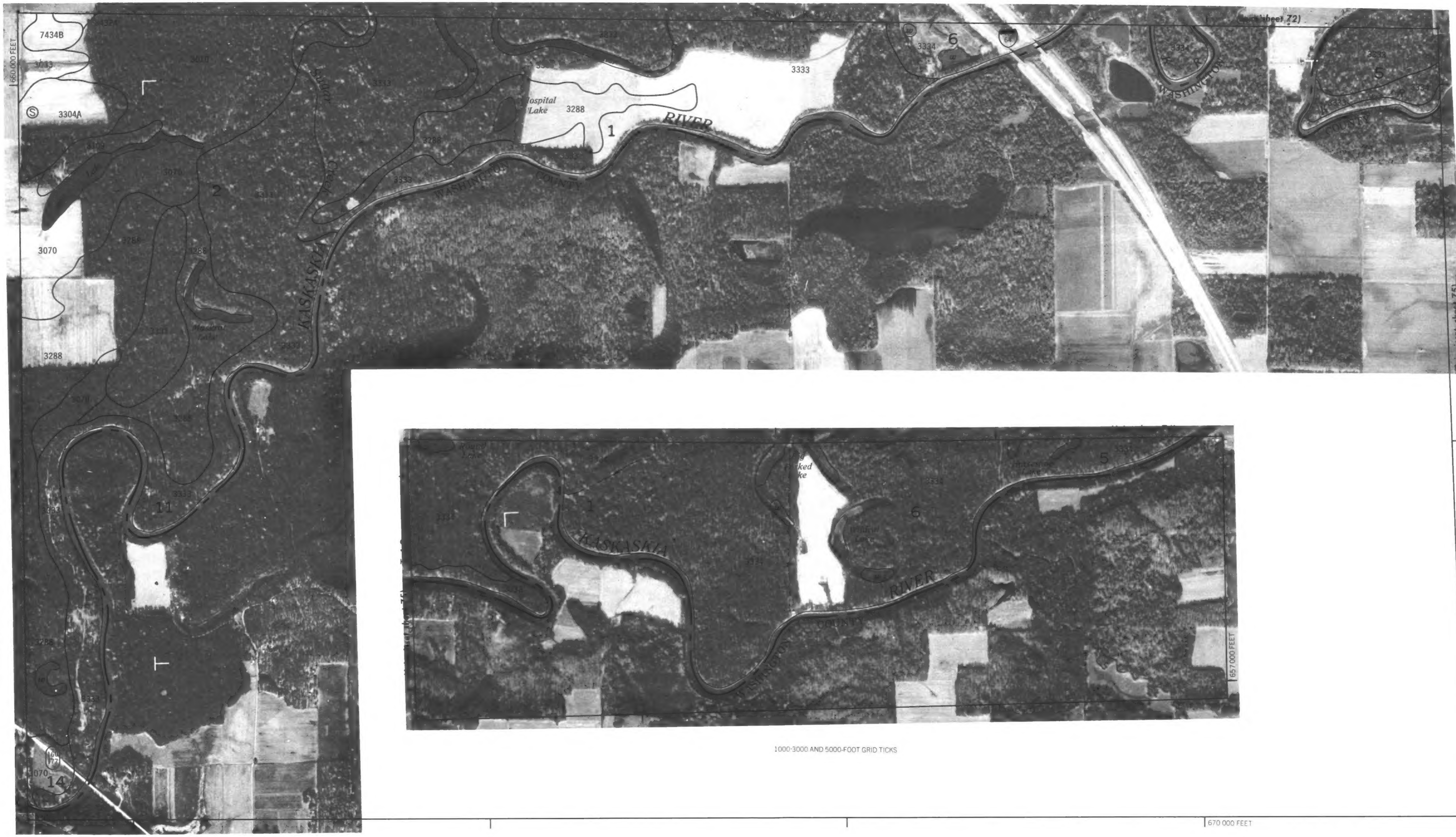
SCALE 1:15 840

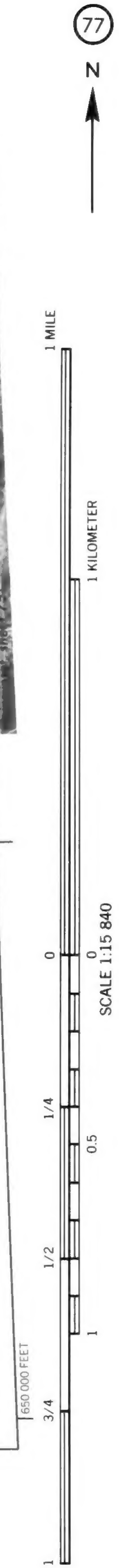
0 1/4 1/2 3/4 1

0 0.5 1

.INOIS NO. 76

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.





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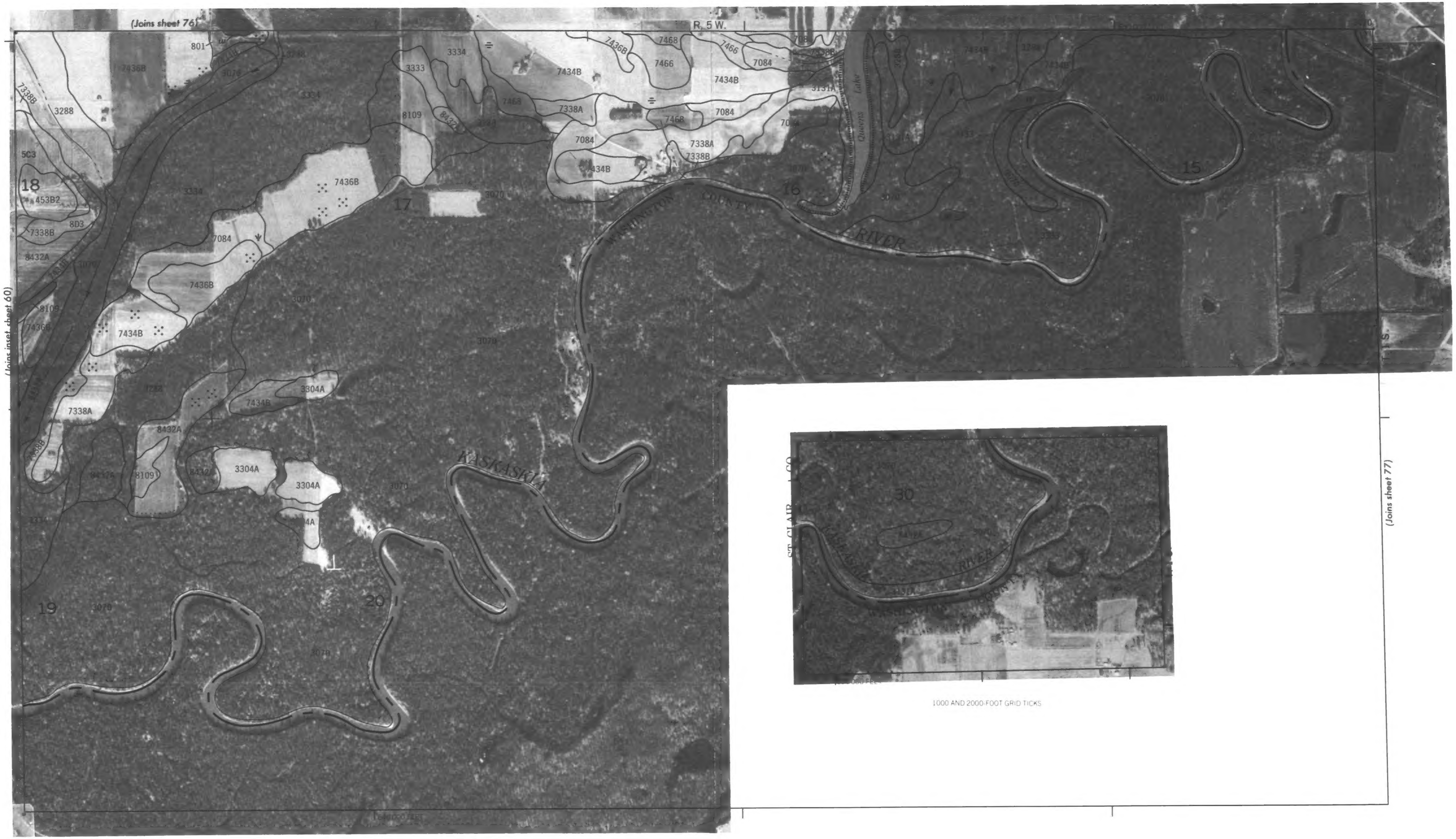
SOIL SURVEY OF CLINTON COUNTY, ILLINOIS — SHEET NUMBER 78

N



1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

CLINTON COUNTY, ILLINOIS NO. 78

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLINTON COUNTY, ILLINOIS NO. 8

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N

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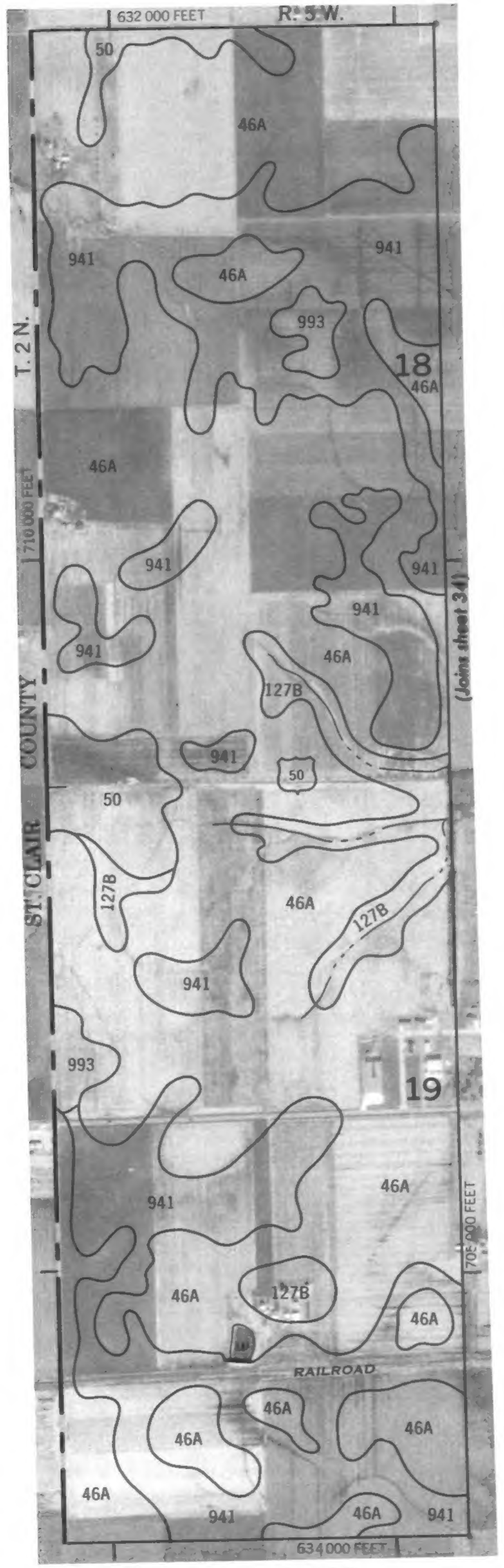
CLINTON COUNTY, ILLINOIS NO. 9

INSET B

(Joins inset A, sheet 9)

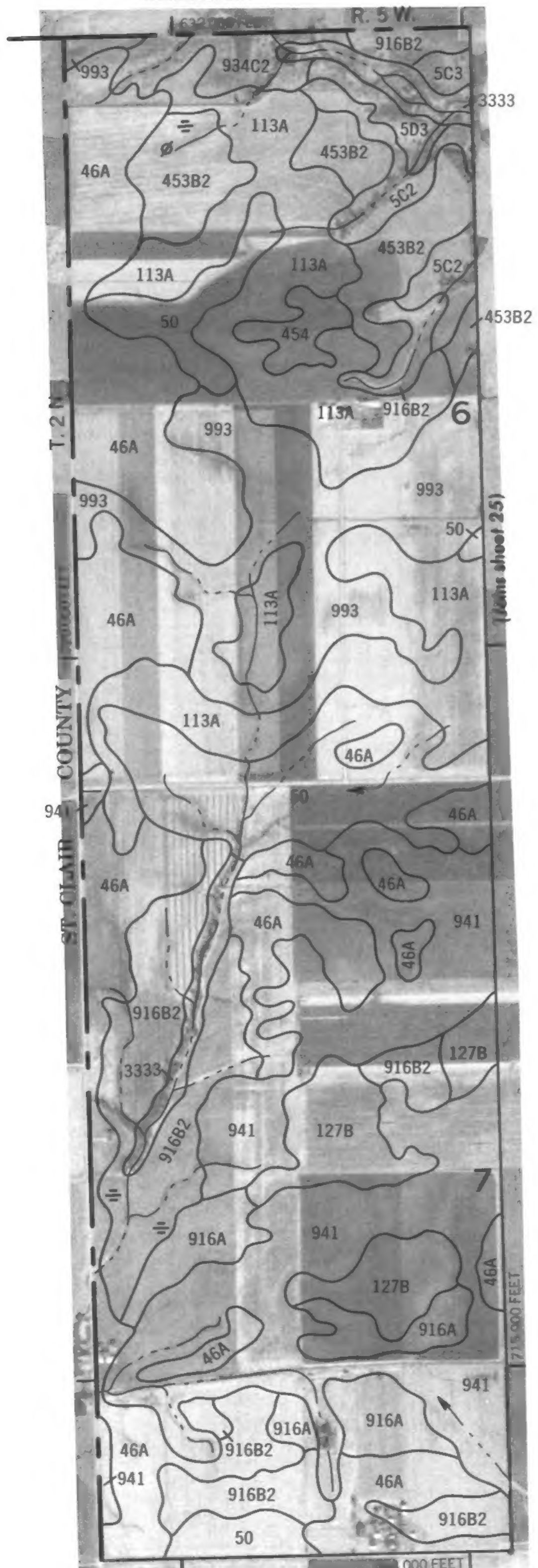


(Joins inset A, sheet 17)

2000 AND 5000-FOOT GRID TICKS

INSET A

MADISON COUNTY



(Joins inset B, sheet 9)

2000 AND 5000-FOOT GRID TICKS